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ABSTRACT

The conference recorded in this document covered a wide variety of themes and consisted of keynote addresses, research presentations, and workshops. The following keynote addresses are include: "Some Recent TAFE National Centre Research and Development in Australian Vocational Education" (Hall); "Vocational Teacher Education: Principles, Practices, Problems, and Promising Directions" (Magisos); and "Educational Training, Industry, and Commerce in the Future--A Contribution Concerning the Needs of School and Teacher Training" (Dahncke). The following research presentations appear: "Getting the Right People: Selection of Tourism Students--A Case Study" (Maddocks); "The TVEI. The University of Liverpool/North West TVEI 16-18 Curriculum Enrichment Program" (Macintosh); and "Keyboarding--A Valuable Skill" (Coleman). The following workshop presentations appear: "An Experimental Study of Incorporating Creative and Inventive Concepts into Vocation High School Curricula (A Correction)" (Wu); "Recent Developments in the Training of Trainers for Vocational Education in Europe" (Peak); "Distance Education: Mid-Career Upgrading and TAFE-Higher Education Articulation" (Atkinson, McBeath); "Engineering Education--Problemsolving Is a Strategy that Appeals to Girls" (Payget); "The Development of Access Mechanisms to Vocational Training for People of Non-English Speaking Backgrounds" (Kelly, Gill); "Introduction to Microwave Cookery for Disabled/Aged Persons" (Cooper); "Equal Opportunities Panelist Training" (Frazer, Ottrey); "The Non-English-Speaking-Background Learner in TAFE" (Mitchell, Frazer, Ottrey); and "The New Entry Lecturer Methods of Instruction Course (NELMIC)" (Mitchell, Trengove, Frazer). (CML)

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TAFE NATIONAL CENTRE FOR RESEARCH

AND DEVELOPMENT

TAFE

INTERNATIONAL CONFERENCE ON RECENT RESEARCH AND DEVELOPMENT IN VOCATIONAL EDUCATION

HOTEL ADELAIDE

MARCH 12-19, 1989

ADDITIONAL PAPERS

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KEYNOTE ADDRESSES

SOME RECENT TAFE NATIONAL CENTRE RESEARCH AND DEVELOPMENT IN AUSTRALIAN VOCATIONAL EDUCATION

William Hall, Executive Director, TAFE National Centre for Research and Development Ltd.

INTRODUCTION

Four main issues have influenced research and development in vocational education during the past two years:

- the interfaces between technical and further education (TAFE); and other sectors of education and employment;
- technological change and industry restructuring;
- equity (e.g. women's issues, training of Aborigines, the needs of migrants);
- accountability.

Each of these is making its impact on the three (broad) components of educational delivery: teaching, students and the curriculum. The interactions are best represented as a matrix, as shown in figure 1. Clearly, the three delivery components are not mutually exclusive and most research deals with all three.

		DELIVERY		
		Teaching	Students	Curriculum
I	Interfaces	1	2	3
S	Restructuring	4	5	6
S	Equity	7	8	9
U	Accountability	10	11	12
E S				

FIGURE 1: Issues: delivery matrix

The structure of the paper will follow this matrix in order to summarise just some of the recent TAFE National Centre research into vocational education.

It is interesting to trace the reasons for the four dominant issues: interfaces, restructuring, equity and accountability. In general, vocational education has not been the initiator, although vocational educators have been quick to respond to these issues when they have arisen. The pressures behind the issues have also (indirectly) influenced vocational education research, leading to a new, more pragmatic model (which is discussed at the end of the paper).

INTERFACES

Figure 2 shows the main education interfaces, their links with employment, and the public's perception of the educational providers' positions on the applied-theoretical continuum. The arrows show student movement.

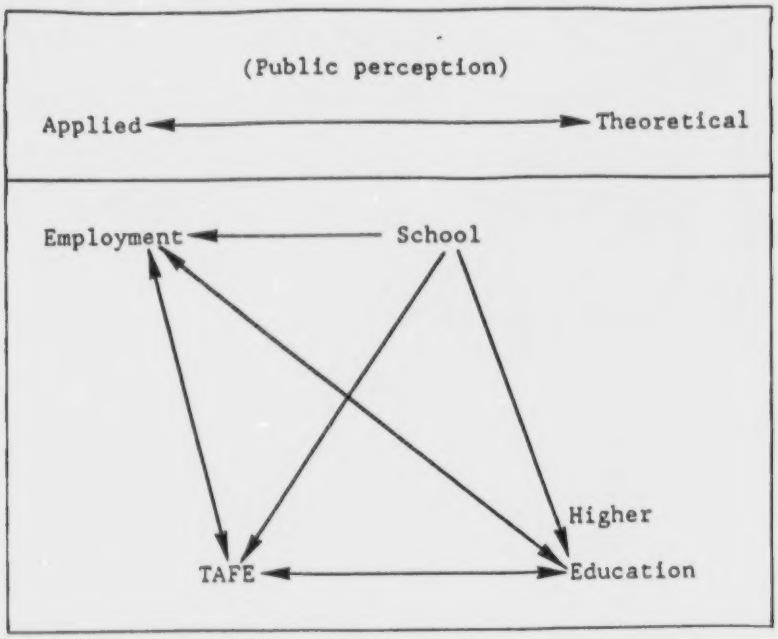


FIGURE 2: Educational interfaces.

Interface pressures for change have largely come from employers, students and trade unions. Political persuasion (especially in the form of government grants for special projects) has also been important (for example, the participation and equity programmes).

1. Interfaces/teaching

Especially during the past six years schools have realised that their curricula are unsuitable for many of their students. Increasingly, schools have moved to vocational educators for help, and cooperative programmes have been developed. Jones & Krzemionka (1988) have reviewed the schools/Technical & Further Education (TAFE) practices and have showed that there are two forms of cooperation: the 'alternative' approach and the 'supplementary' approach. State evaluations of cooperative programmes have also been published.

The Jones & Krzemionka study dealt mainly with student and curricula issues. Two videos were produced and the second of these emphasises the needs of students.

There has been no national research into the TAFE-higher education teaching problems (as distinct from student and curricula problems) but work is presently proceeding on the joint use of facilities. However, there has been much recent interest in the TAFE- employment interface. Hall (1987), Mageean(1987) and Krzemionka (1987) have all looked at the continuing needs of academic staff. Hall showed that there is an urgent need for continuing education programmes which enable lecturers to update their technical/vocational skills in their teaching areas, and there is an urgent need to provide ways in which lecturers can keep abreast with technological change. In a national survey, over 90% of all TAFE colleges recognised these as severe or important problems.

Hall (1988) investigated the TAFE/industry partnership, including ways in which vocational educators could strengthen their links with employers (links which, for a wide variety of reasons, seem to have weakened at the lecturer level in recent years). The overwhelming evidence from the interviews conducted was that TAFE is generally highly regarded and that industry is keen to strengthen its links with colleges. Sheldrake (1988) found ways in which TAFE and industry could share facilities, equipment and personnel.

2. Interfaces/students

Parkinson, Mitchell and McBeath (1986) in their study of cross sectoral transfer of students from TAFE to higher education showed that there was little transfer (although that is quickly

starting to change) and that there was a lack of consistency and public policy on transfer from vocational to higher education. Also, there was little information available from universities and colleges on the success of TAFE qualified students who had transferred to higher education. There were numerous recommendations in the report, some of which have been adopted.

The distance education needs of 15-19 year old students were investigated by Guthrie and Krzemionka (1987). This study covered TAFE and higher education (universities and colleges). They showed that there is a place for off-campus or mixed-mode studies for this age range.

Industry restructuring is bringing strong demands for greater integration and 'articulation' between educational institutions and between schools, TAFE and higher education. This and other issues are discussed by Hall and Hayton (1988).

3. Interfaces/curriculum

A common complaint is that schools have generally prepared students for higher education, ignoring the needs of the majority of students who proceed to vocational education. Most students (about 70%) who undertake any post-school studies, do this work in TAFE. In the past, school curricula have not reflected this. Foyster (1988) set out to investigate the mathematics used by young workers within five occupations: business studies, electrical trades, horticulture, hospitality and metal trades. One recommendation in the report was that school mathematic curriculum development should concentrate on the applications of mathematics.

Foyster was interested in the school/TAFE interface. Lane and O'Brien (1987) conducted a case study at the TAFE/higher education interface in which they described the development of a college of advanced education (CAE) and TAFE conjoint programme in library information studies. One aim was to provide an educational continuum and incentive to further study, by eliminating duplication in the undergraduate course of study.

Thompson (1988) looked at the gaining of credit for past experience. He strongly challenges the claim, frequently made, that experience cannot be assessed in a reliable and valid way.

RESTRUCTURING

A revolution is presently occurring in much of Australia's industry, partly catalysed by recent wage negotiations, but mainly because of the need to compete in sophisticated world markets. This is summarised in figure 3, taken from Hall and Hayton (1988).

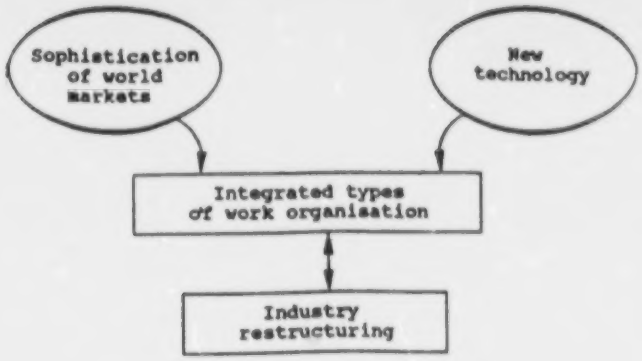


FIGURE 3: Industry restructuring and technological change.

Industry restructuring is starting to have major effects on all three areas of educational delivery.

4. Restructuring - teaching

Because of the huge forces presently attempting to bring about change, it is especially important to carry out analytical studies into training needs. Therefore, Hayton et al (1988) have produced a timely monograph on training needs analysis.

Meeting vocational educator staff development needs will be vital to the success of changes to training. To give just one example: Hall (1988) has shown that vocational education is good at dealing with the "How?" questions, but usually ignores the "Why?" and "What if?" questions, which are of special importance if technological change is to be understood.

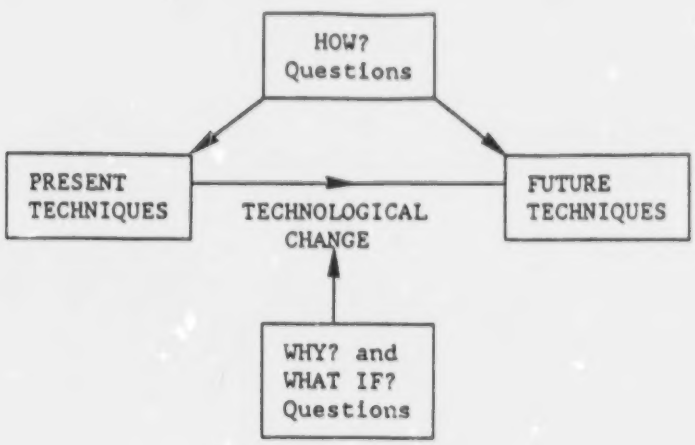


FIGURE 4: The How?, Why?, and What if? Questions.

Hall's (1987) research into the continuing education needs of full time TAFE college lecturers has already been mentioned. Mageean (1987) is continuing her work with senior college staff. In her report she urges an increase in the use of staff from outside TAFE in TAFE/senior college staff development activities.

5. Restructuring - students

Hall and Hayton (1988) emphasize that industry restructuring will lead to the need for worker retraining. They point out that it will usually be inappropriate for workers to start at day one of a formal course and then go on to complete the whole of that course. The jargon is 'articulation', allowing for both horizontal and vertical mobility. An example of such linkages was provided by Hayton and Cheyne (1988) in their evaluation of post-trade courses in fluid power relevant to the national metal industries award. A much larger study is presently being undertaken for the building industry.

New approaches to teaching will be needed, with a greater emphasis on 'open learning'. Guthrie (1987) looked at one of the major applications of the computer to vocational education, computer managed learning.

Thomson and Storey (1987) conducted a preliminary investigation into transferable skills in the the hospitality industry. The work was sufficiently encouraging for an extension of the research.

6. Restructuring - curriculum

Part of TAFE's dilemma, discussed by Hall (1988a) is how soon during the development of a new process on the manufacturing of new materials should vocational education start to plan for training? Figure 5 is the developmental cycle.

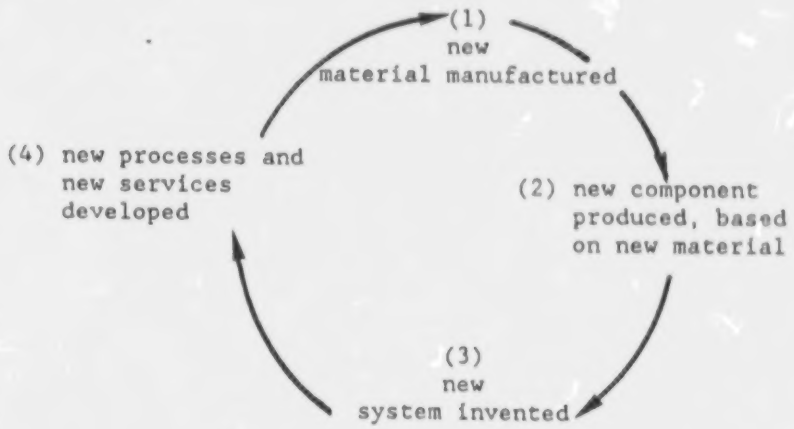

(1) new material manufactured
(2) new component produced, based on new material
(3) new system invented
(4) new processes and new services developed

FIGURE 5: The developmental cycle

Hayton (1987) tackled this for the printing industry and recommended different uses for the different training providers, as shown in figure 6.

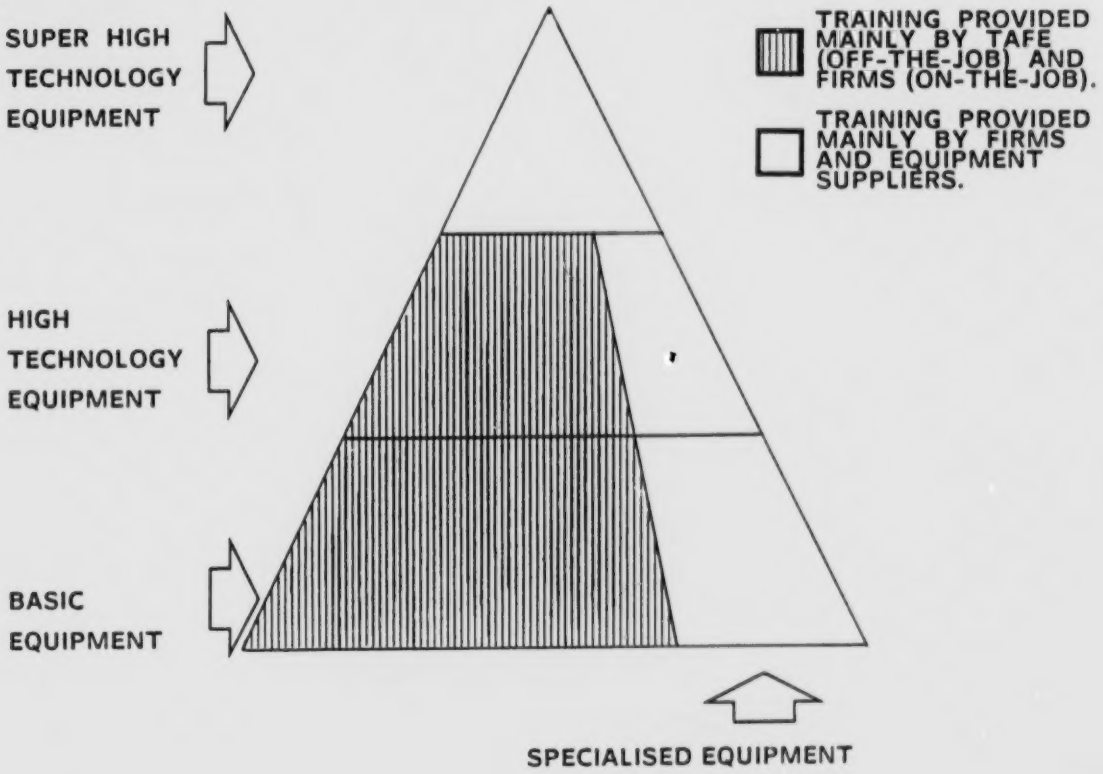
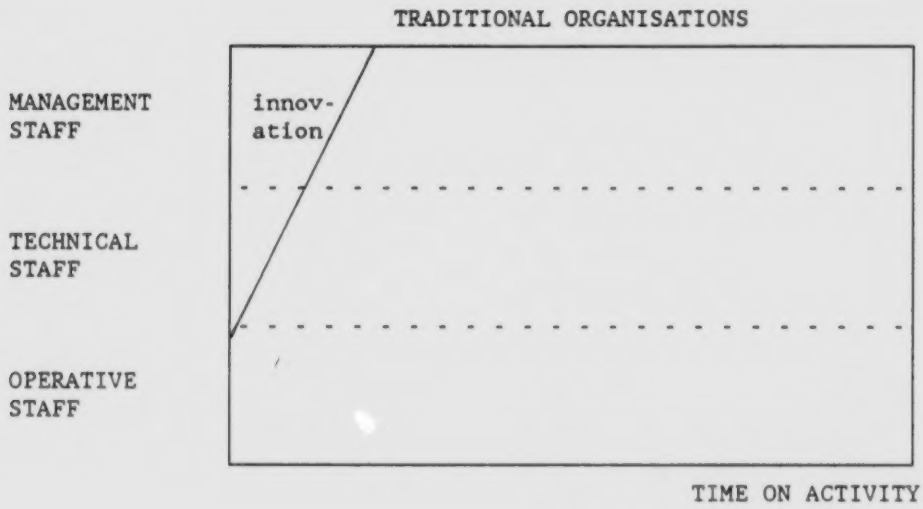

SUPER HIGH TECHNOLOGY EQUIPMENT
HIGH TECHNOLOGY EQUIPMENT
BASIC EQUIPMENT
SPECIALISED EQUIPMENT
TRAINING PROVIDED MAINLY BY TAFE (OFF-THE-JOB) AND FIRMS (ON-THE-JOB).
TRAINING PROVIDED MAINLY BY FIRMS AND EQUIPMENT SUPPLIERS.

FIGURE 6: Provision of training for each category of equipment in the printing industry.

Industry restructuring will affect curricula in other ways. For example, the concept of 'quality' as reported in Neylon, Hayton and Inglis (1988) will need to be infused throughout all vocational education courses. The roles of people within organisations are changing and these changes will be reflected in the curricula, as illustrated in figure 7, which is taken from Hayton and Harun (1988).



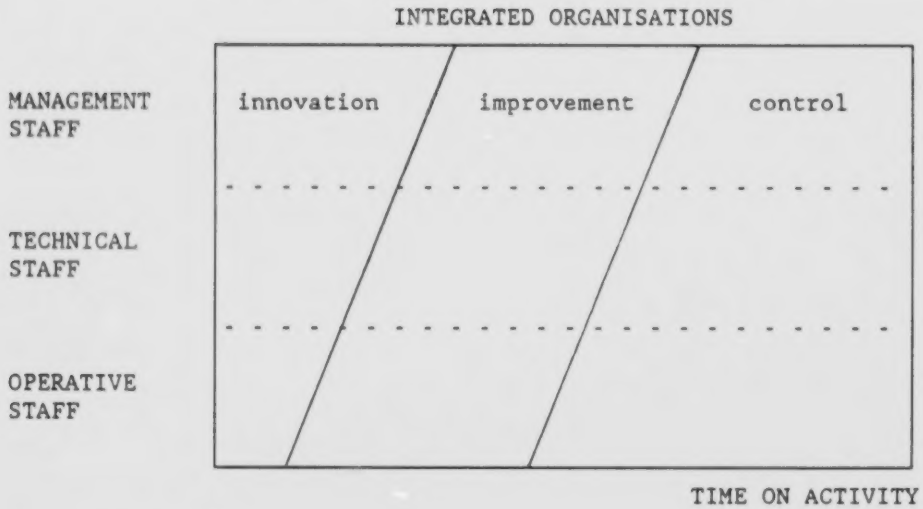


FIGURE 7: Changes to work practices

How successfully is industry training its workers? was a question considered by Bone (1988). The answer was: frequently not very well. The overall impression of current training and staff development in Australian industry was found to be depressing, but with some notable exceptions.

EQUITY

The disadvantaged generally includes a number of heterogeneous groups: non-English speaking migrants, Aborigines, women, young unemployed, older unemployed and the rural population. Special educational programmes and special financial provisions have sometimes been made for most of these groups, although the needs of some have yet to be fully recognised.

7. Equity - teaching

Parkinson (1987) investigated ways in which vocational education might be delivered to people in remote areas. The study examined the following means of providing services: self-study centres, residential facilities, branch classes away from the main college campus, mobile teaching units, distance education, tele-communication, radio and television.

Budge (1989) has shown that non-metropolitan Australians really are educationally disadvantaged. The traditional way of dealing with the problem is through external studies. Although there is anecdotal evidence, and some local case studies, there is a need to conduct national research into the most appropriate ways of teaching disadvantaged students.

8. Equity - students

The best researched group is women. Moran (1986) found that female apprentices faced particular problems in their access to, and experience in, the non-traditional trades because of beliefs about the work of females in society. For example, information about trade-training opportunities was hard to obtain and harassment was not uncommon.

Pocock (1988) examined the experiences of women in England, West Germany and Sweden. She makes the point that the "comfortable concept of equal opportunity will not suffice: women don't start in an equal position with men and, without action, they never catch up."

Mageean (1988) identified many of the educational needs of isolated rural women. The report contains numerous vignettes, one of which follows:

> *'One young woman attending a course in Cleve, South Australia wanted to be taught to drive a tractor in an all women class. She explained that had she asked any of the males on the property to teach her they would have laughed at the very idea. She wanted to be able to show them by using the tractor competently, that she could play a bigger part in running the farm.'* (p.27).

Australia now recognises that it is a part of the S.E. Pacific region and that skills are required in order to trade in the area. Hall (1987) conducted a national survey to determine the demand for people with Asian skills in industry, commerce and the public sector. The study found that over the next five years, about 100,000 formally trained people with Asian skills are likely to be required by industry.

The gaining of credit for past experience has already been referred to. It is also an equity issue. Strachan and Thomson (1987) looked at Australian practices in crediting the previous training and experiences of mature-aged students in formal TAFE courses.

9. Equity - curricula

Specific curricula for particular groups have been produced. A major women's access programme is New Opportunities for Women (NOW). Richards (1987) evaluated a NOW TAFE access course for mature-aged women. She concluded that considerable changes needed to be made to mainstream courses if the gains made by women in NOW course are to be consolidated.

Noble, Kalantzis and Cope (1988) attempted to develop a course specifically for those who were placed on the fringe or excluded from further education, with special emphasis on an appropriate teaching approach. A major curriculum project for remote Aboriginal Communities is described by Guthrie and Bourke (1989).

ACCOUNTABILITY

Until recently, evaluation has been an educational activity, generally not regarded as a threat because the results of evaluation were usually kept confidential; and, frequently, the instruments of evaluation were administered by the person being evaluated. All that is changing. This is partly because of 'ownership', partly because of political pressure, and partly because economists have become increasingly influential in education. The new words are 'accountability', 'performance indicators' and 'corporate planning'.

10. Accountability - teaching

White's (1987) paper on accountability in TAFE proposed that evaluation of TAFE's educational activities is essential both to meet the demands for increased accountability for all stakeholders in TAFE, and to provide a proper basis for planning. He proposes a model (which has subsequently been adopted by New South Wales).

With the introduction of new occupational health and safety legislation it has become important for vocational educational institutions to provide staff and students with the highest possible level of protection against occupational injury and disease. Samnakay (1988) analysed accident rate and interviewed health and safety personnel. He discovered that cleaners and gardeners were the occupational groups most likely to make a claim for compensation.

The range of performance indicators is described by Guthrie (1988). He claims that, ideally, performance indicators are concerned with increasing the efficiency, effectiveness and appropriateness of programmes, activities or strategies, as shown in figure 8.

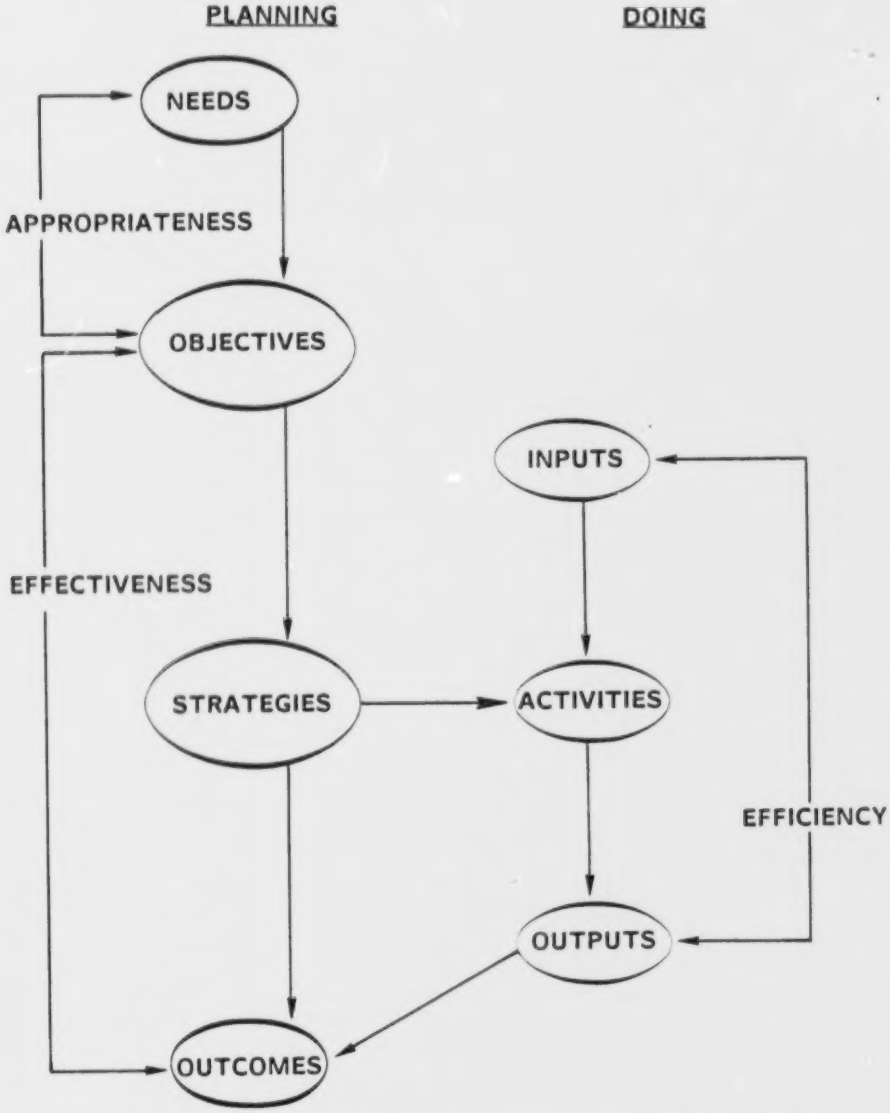


FIGURE 8: Performance indicators: efficiency, effectiveness and appropriateness.

11. Accountability - students

In one sense, all students assessments are performance indicators. Numerous assessment publications have been produced over the years. One recent report (Mageean and Wilson, 1988) dealt with the assessing of literacy performance of adults.

Hayton, et al (1988) have produced a detailed training needs analysis manual which will be of use to evaluators.

The attrition of students, especially part-time students, has been a matter of concern for many years. Parkinson, Hayton and Strachan (1987) identified the difficulties encountered by first-year part-time TAFE certificate students which cause them to consider withdrawing and, in many cases, drop out. The main troubles were classified as 'academic', 'environmental' and 'background'. Student counsellors have an especially important role in helping these students.

12. Accountability - curricula

Parkinson and Broderick (1988) conducted an evaluation of the implementation of national common core curricula in Australia. The general conclusion reached was that the development of national common core curricula had proceeded well.

Advice on conducting evaluations of TAFE programmes was provided by Foyster et al (1986) and straight forward information on student assessment was given by Thomson (1986). Numerous evaluations of local curricula are reported in Initiatives in TAFE.

A NEW MODEL FOR RESEARCH IN MANAGEMENT

The four dominant issues discussed in this paper have also influenced the way vocational education research has been conducted.

Until recently, most educational research was regarded as a fairly leisurely activity with variables such as 'aims', 'teaching approaches' and 'evaluation' being linked together. That has now changed. A more realistic model is shown in figure 9.

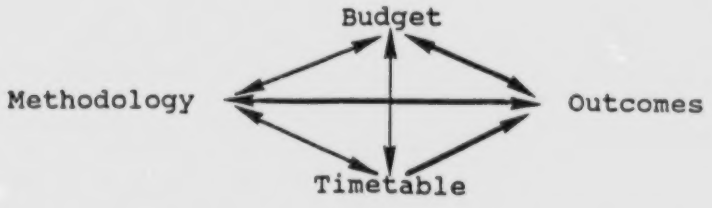


FIGURE 9: Managing education research

Planning usually starts with 'outcomes' and 'budget'. These then determine the 'timetable' and 'methodology'; although the timetable is also a frequently imposed constraint. In other words, we rarely start with the methodology in our planning, which is what often used to happen.

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VOCATIONAL TEACHER EDUCATION
Principles, Practices, Problems, and Promising Directions

by
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INTRODUCTION

All would agree that the effectiveness of vocational education and training programs depends to a large degree on the effectiveness of individual teachers or instructors. When programs are perceived as not effective, as has been the case in the United States recently, fingers are pointed at the teachers and at the programs which prepared the teachers.

Most of us realize that success and failure in education and training does not ride on teachers and teacher education alone. There also must be adequate facilities and equipment, appropriate curricula and instructional materials, effective leadership and supervision, meaningful business and industry involvement, and rigorous standards of program accreditation and completer certification.

Recognizing that there is plenty of blame to go around, vocational teacher educators need to take a good look at the changes that are taking place today, followed by some serious introspection about the teacher education program. I will endeavor to highlight some of the relevant changes, suggest principles that ought to be considered, describe some of the practices in use, underscore the problems, and suggest some promising directions. I will draw heavily on experience in the United States and make a few observations of the situation in other countries. It will be up to you to draw inferences for your own use.

Changes in the Workplace and in Education

In the past decade there has been mounting pressure to respond to a number of significant changes in the workplace and in education. These have included technological changes, demographic trends, socioeconomic dynamics, and new work force patterns.

Technological Change

Computer technology provides the capability to double the knowledge base every 7-8 years. Communication technologies (i.e., the satellite industry, computer networking, modems, facimile transmission, teleconferencing, and electronic mail) increase the ability to transmit knowledge. Laser technology (e.g., laser printers, interactive laser disks) increases the ability to apply knowledge.

Robotics may cause decreases in non-technical jobs with some corresponding increase in technical jobs. New technologies may speed or economize ground, water, or air transportation. The solar-powered car race in Australia demonstrated just one possibility for change in passenger travel on the highways. Computer-controlled sails on freight ships may economize ocean transport. Supersonic aircraft may make the run from Los Angeles to Sydney in a quarter of the time.

Demographic Trends

In the U. S., minorities are becoming majorities, thereby forcing society to deal with related social, economic, and political problems. The U. S. population is aging and the aged are becoming a powerful political force-- there are 23 million members in the American Association of Retired Persons. The homeless poor are coexisting with young urban professional people (YUPPIES) and older couples with double incomes and no kids (DINKS). In other countries this bi-polarization of the population is even more pronounced with only a few rich and many poor.

Socioeconomic Dynamics

A new set of socioeconomic dynamics is operating. First, there is a globalization of the economy and growing concern about the environment. Economic development is the concern of both industrialized and underdeveloped countries.

Amidst this, there is an increasing demand for accountability with respect to product quality, consumer safety, and environmental hazards. Lee Iaccoca, president

of Chrysler Corporation, is touting a Car Buyer's Bill of Rights that promises more safety, better long-term protection, and higher quality. Courts are awarding large judgements for individual accidents related to product deficiencies. Governments are obtaining judgements against multinational corporations for industrial accidents that affect people or the environment; for example, Union Carbide settled with the Indian government for $470 million for the Bhopal diasaster.

Workforce Patterns

In the U. S., the hiring signs are out because there are fewer entry-level employees available. Retired persons are gradually replacing the teenaged youth in fast food restaurants. In other countries, the proportion of young, entry-level people is very large and there is little opportunity for work. Women will be 60% of the U. S. workforce by 1990. In other countries, women are just starting to gain entry to the workforce.

People in the U.S. workforce are becoming concerned about childcare. They are bargaining for flexible hours, better vacation and sick leave, job sharing, parttime employment, health care, and wellness programs. Employers are beginning to realize that these changes are beneficial to productivity and profit.

Organizational structures are being re-examined. The mid-career compaction that is occurring in many U. S. companies is lessening the opportunity for promotion. As a result, employees are demanding and getting an opportunity to participate in team management decisions.

With respect to career styles, there are fewer linear career paths, more freeform career styles (i. e., a mix of permanent, parttime, and temporary positions; personal leaves), mixing of education and work, contracting or leasing of workers, and flexible time schedules.

The Implications for Change

There is increasing acceptance of the reality of these changes by employers, employees, and educators. More technical literacy is being required of employees. The influx of minorities and women is being accommodated. Career development paths are being enhanced through company-sponsored programs that provide vouchers for employee-chosen career development activities.

Vocational teacher education needs new perspectives and new talent to cope with these changes. Vocational education needs to prepare workers for this new and different occupational world and for the different approaches to career development. Research and development is needed to develop new strategies for accommodating these changes. New curricula, a global perspective, a redefinition of career development, and revised teacher education programs will be required. (Smith, 1988)

It is my contention that a discrepancy analysis model can be applied to the issues facing vocational teacher education. That is, the difference between what should be (principles) and what is (practices) will reveal the discrepancies (problems) to which can be applied solutions (promising directions). What I see, instead, is a tendency to protect turf, hang on to the past, and keep control. Nevertheless, I will direct the rest of my discussion to principles, practices, problems, and promising directions.

PRINCIPLES

The principles by which vocational teacher education should operate are nested within the principles by which a good vocational program should operate. Less emphasis should be placed upon the needs of the teacher education institution, the teacher educator, and the school in which the vocational program will operate. Too often programs of teacher education are developed for the convenience of the institution or the professors. In fact, those involved in international development have become disillusioned with institution building as a development strategy because the institutions become entities unto themselves.

Principles of Vocational Education

Over the past seven decades, a set of vocational education principles has evolved. Although one must be cautious about applying them universally without consideration of new developments, these principles have direct bearing upon the education of vocational education teachers. Allen (1974) discussed 18 principles of vocational instruction:

1. Instruction must be current with and based upon an up-to-date analysis of an occupation's employment skill demand.

2. Instruction should be based upon broad core curricula characterized by flexibility in offerings.

3. Instruction within the broad core curricula should be based upon specific target jobs.

4. Instruction must be provided in the adequate time frames necessary to simulate job situations.

5. Instruction should, as much as possible, be self-pacing with emphasis placed on the quality and quality standards of an occupation.

6. Instruction requires adequate facilities and equipment to accommodate learning activities and to simulate, or be, actual job situations.

7. Instruction should be given by teachers who have had occupational experience in the subject(s) that they are teaching.

8. Instruction becomes effective when teachers participate in both preservice and continuous inservice teacher education programs.

9. Instruction must be directly related to clearly-defined student goals.

10. Instruction should be prescriptive, preceded by an analysis of the learning needs of each student.

11. Instruction must adapt to identifiable student effort factors so that all students can become motivated to learn.

12. Instruction must be individualized to provide for wider differences in background and learning abilities, and grouped for developing team contribution skills.

13. Instruction should be given to accommodate the students' learning requirements in an occupational atmosphere with grades reflecting payment for work well done.

14. Instruction must develop originality, intitiative, and thinking abilities rather than memorization without understanding.

15. Instruction must instill work habits required by an occupation.

16. Instruction should include information and activities designed to protect and conserve human life.

17. Instruction must be evaluated by student performance criteria based as realistically as possible on occupational demands.

18. Instruction must have job placement and/or advancement or employment realignment as its end result.

With these statements of principle, essential elements of a vocational teacher preparation program take form. Obviously, there is a need for teachers to have an occupational background, the knowledge which underlies occupational practice, the basic academic skills which capacitate learning, and professional competence as a teacher.

Essential Elements of Teacher Preparation

Most agree that, ideally, vocational teachers should be generally or *liberally* educated, *technically* skilled, and *professionally* competent. Vocational teachers should be able to impart societal values to students and hold their own intellectually with academic teachers. Certainly, vocational teachers must be technically competent in their occupational areas. And, of course, vocational teachers should be professionally competent as teachers.

General Education

General studies should enable prospective teachers to reason, communicate, compute, speak a technical (e.g., computer, statistical) or foreign language, engage in scientific inquiry, and use available technology. A liberally educated teacher should be familiar with the history of civilization, literature and the arts, economics, and the social and behavioral sciences. (Tozer and Nelson, 1988)

Technical Competence

While the content of an academic course may center upon knowledge (e.g., facts, the relationship between facts), the content of a vocational or technical course must also emphasize technical performance. In the typical college-based vocational teacher education program, technical majors tend to be too crowded or watered down to provide either.

Hence, they fail to be effective for teacher preparation or respectable in the academic community. Both competency and respectability are needed. The dilemma is to provide an academically acceptable technical degree program and still prepare the individual professionally within the time constraints of the typical four-year college program.

Professional Competence

Professional education should include foundation courses in psychology and sociology. Teaching methods must be developed that take into consideration the more diverse populations now being served.

And, of course, field experience in both a school and an employment setting is needed. People still learn what they want to know in natural ways. They learn in social situations, on the job, at home, and on the playground without much structure or direction. This is probably why society, in its best efforts to ensure competence in its most trusted professionals, still requires a practice element such as clinical experience for physicians, apprenticeships for plumbers, and student teaching for teachers. Student teaching for prospective vocational education teachers should be an affirming experience. (Hedges, 1989)

Prospective teachers need to have a broad knowledge of the profession and the mechanisms used by the profession to generate new knowledge and to improve professional practice. (Phelps and Cole, 1988)

The foregoing is consistent with the recommendations of the Carnegie Foundation reported by Boyer (1983):

- A core of common learning, roughly paralleling the high school core curriculum
- Careful selection, at the end of the core curricula, of those with above average grades and strong support from two professors
- Completion of a major in an academic discipline and classroom observation
- A fifth year of instructional and apprenticeship experience
- Continuing education

PRACTICES

Approaches

There are several approaches to preparing vocational education teachers. The approach taken depends upon a number of factors including the nature of the occupational area, the organization undertaking the vocational education program, the availability of potential teachers, the urgency of the program, and the available organizational structures for preparation of the teachers.

Preparing Vocational Teachers at Colleges and Universities

In the United States, several vocational program areas have a tradition of requiring a Bachelor's degree in the subject matter field (e.g., agriculture, home economics) plus professional preparation leading to teacher certification. While this results in well-prepared professionals, it also gives rise to several difficulties. Teachers prepared in colleges and universities tend to lack mature occupational experience. An individual with a degree in a technical area may find the private sector alternative for employment too attractive to enter or stay in teaching.

Such an approach requires long-term committment by the agencies and institutions, a competent professional education faculty at the teacher education institution, and incentives to candidates to enter teaching (e.g., competitive salaries, respect, future potential in the job).

Preparing Technically-Competent Workers Professionally

In the United States, such fields as trade and industrial education, health occupations education, and marketing and distributive education typically recruit potential teachers from the ranks of workers in the field. Opportunities are given to earn professional certification through a series of summer and inservice courses.

In a period when vocational agriculture programs were expanding into off-farm occupations in the United States, persons were recruited from business and industry and given opportunity to earn certification though a series of courses.

Teachers with solid, advanced level occupational experience, enter teaching with more technical skill and job savy. One

of the problems with the approach is that these teachers, being older, find it difficult to become fully credentialed; that is, obtain an academic degree and schedule student teaching experience.

In other countries, with different systems, the approach to teacher education in different; for example--

> Since the 1920s, instruction in the vocational schools in the dual system in Germany has been given by vocational teachers who usually had former training as skilled workers before taking the teacher course. In company training since the 1930s, the master craftsmen have had to demonstrate their ability to teach in their masters'examination. Since 1972 the Vocational Training Act has made it obligatory for all company training personnel to have a teaching qualification. A strong sense of occupational status is now developing among the trainers, furthered greatly by state recognition of their function. There are growing demands for independent status with formalized training. (Schmidt, 1979)

Preparing Academically-Prepared Individuals Technically and Professionally

An alternative to preparing vocational teachers in colleges or recruiting potential teachers from business and industry is to recruit and train academically-prepared individuals. This training would need to focus on both the technical and professional dimension of preparation unless the individual did, in fact have either teaching or occupational experience in a technical field.

In the World Bank-sponsored Technician Training Center project in the Republic of Turkey, center directors and instructors were selected upon the basis of their degrees in scientically-related academic disciplines. Unfortunately, the teaching candidates had neither professional preparation nor technical occupation experience. Their motivation for participating in relatively short-term professional and technical training was for reasons other than a teaching career, but instead to refine English skills and qualify for a job in industry.

Programs

College-Based Teacher ducation

The traditional model for college-based teacher education has existed for 50 years in the U. S. It included two years

of foundational education, and two years split between technical preparation and teaching methods. More recently, extended time models have been tried:

Four plus one for a subject-based bachelor's degree
Four plus one for an internship
Five year for bachelor' and master's degrees
Five plus one for a master's degree and an internship
Four plus two for professional studies and clinical experience (Luft,1988)

Most of the degree programs for vocational education teachers tend to be either very general or somewhat shallow. For example, an agricultural education major would take a degree in general agriculture with little specialization as contrasted to a major in animal science or plant pathology.

The granting of college credit for occupational experience is being enhanced by occupational testing programs. In the U. S., the National Occupational Competency Testing Institute examinations are being used by some colleges to determine technical competency and to grant credit for industry exerience. In the United Kingdom and elsewhere, the City and Guilds can certify occupational competence in a broad range of occupations.

Agency-Based Instructor Preparation

In vocational education at the secondary level, state education agencies have taken on the preparation and certification of industry-trained instructors, particularly for secondary schools and adult programs. Often in cooperation with colleges, the agency provides the industry-based employee with an intensive teaching methods course, ongoing inservice courses, and close supervision during the first year of teaching. At the postsecondary level, industry-trained teachers usually are put into a sink-or-swim situation, although seminars and workshops are sometimes provided by the institution.

Performance-Based Teacher Education

In a long-term, well researched process, the National Center for Research in Vocational Education at The Ohio State University developed 132 modules for performance-based teacher education (PBTE) in college-based pre-service programs or for competency-based staff development (CBSD) in school-based inservice programs. The modules are organized into 14 categories:

Program Planning, Development, and Evaluation
Instructional Planning

Instructional Execution
Instructional Evaluation
Instructional Management
Guidance
School-Community Relations
Vocational Student Organization
Professional Role and Development
Coordination of Cooperative Education
Implementing Competency-Based Education
Serving Students with Special/Exceptional Needs
Assisting Students in Improving Their Basic Skills
Teaching Adults

The essential characteristics of the preformance-based teacher education approach are that--

Training is based upon competencies needed in teaching
Training is tailored to individual needs and interests of the teacher
Assessment of each competency is criterion referenced
Frequent feedback is given to the teacher
Both a teacher and a resource teacher are held accountable for learning
Competencies must be demonstrated in an actual teaching situation (Hylton, 1988)

The PBTE materials have been used in a number of ways; for example, one college uses them in a diagnostic-prescriptive process during student teaching and first year supervision. Some agencies use a subset of the PBTE materials for teachers from industry who are teaching for the first time. The PBTE approach has been used successfully in the United States and other countries in a wide variety of settings. PBTE has accomplished increased access to teacher certification and upgrading, increased productivity and accountability by teacher education programs, added impetus toward competency-based vocational education, and improved competency of teachers.

Certification

Most state agencies require some kind of certification of teachers at the secondary level, but not at postsecondary institutions where college degrees and industry experience tend to hold sway. Agency certification and college preparation programs tend to go hand-in-hand. Unfortunately, they also tend to perpetuate existing preparation programs.

Heglar and Antonelli (1988) describe a new concept, the educational warranty, being offered by eighteen colleges and universities. Basically, the college or university promises

that teachers trained by it will perform adequately in the classroom. If not, the university or college will remedy the situation with further course work, supervision, or other services. In some cases, the warranty is extended to cover competence in academic areas as well. Great Oaks Joint Vocational School is issuing warranties on its vocational graduates. Employers may request additional educational services when graduates fail to perform as promised.

The City and Guilds of London Institute offers inservice development courses for teachers in further education administration, design and management of learning, and teaching students with special needs. The City and Guilds tests achievement and issues certificates in direct training, youth training, and adult training.

PROBLEMS

The problems besetting vocational teacher education are probably evident in the foregoing discussion of principles and practices. However, the storm of criticism of education and teacher education and the subsequent actions may provide useful insights.

Dissatisfaction With Teachers and Teaching

Although vocational education escaped attention in its report, the National Commission on Excellence in Education expressed deep dissatisfaction with the U. S. educational system, particularly at the secondary level. Citing lower college entrance examination scores and poor comparison to systems in other countries, the National Commission recommended emphasis upon a core of learning, stiffer subject matter requirements, and *more able teachers*. (A Nation at Risk, 1983)

Reform Movement in the U. S.

Various commissions, committees, and councils representing other interests (e.g., science and technology, economic development) also issued reports containing recommendations that called for more rigor, more courses, and better teachers. A reform movement was underway!

Teacher education did not escape criticism. In fact, Hughes (1984) observed that--

> The critics proposed solutions that range from elimination of teacher education programs to development of comprehensive 6-year programs.

One such study had something to say about vocational education. The Committee for Economic Development (1985) said that--

> First, too many students in occupationally-specific vocational education programs have simply not had the necessary grounding in basic academic and behavioral skills that are the minimum required for most entry-level positions in today's market. Second, vocational education students too often learn nonacademic or vocational skills that do not relate to the kinds of jobs that are normally available in the economy.

The Committee recommended requiring students to demonstrate academic achievement before entering vocational education, meeting labor market standards, developing joint programs with employers, improving the quality of instruction, and involving the business community in the programs.

Reaction to the Reform Movement

The educational reform movement in the United States accounted for over 700 pieces of state legislation in 1983 and 1984. Many of these legislative changes were aimed at teachers and teacher preparation. These changes were in a number of areas: salary increases, merit pay, elimination of teacher education, proficiency tests for teachers, and teacher career ladders. (Weber, 1988)

A consortium of about 100 of the nation's colleges of education (Holmes Group), committed to improving teacher preparation, set five broad goals or tenets:

- To make education of teachers intellectually sound
- To recognize differences in knowledge, skill, and committment among teachers
- To create relevant and defensible standards of entry to the profession of teaching
- To connect schools of education with secondaruy schools
- To make schools better places for practiocing teacjhers to work and learn (Griggs, 1988)

A major study, reported by Weber (1988), revealed that vocational teachers differed significantly from other teachers. They tended to provide--

- More practice, less lecture
- More individual, less total group, activity

More performance assessment, fewer paper and pencil tests

It would appear that some caution must be taken in blindly accepting the recommendations meant for general education. More likely, vocational education teachers have their own unique set of deficiencies and need for improvement.

Deficiencies of Approaches and Programs

Programs

Traditional college-based teacher education programs are preoccupied with schools and there is no clear vision about what they should really be like. Phelps and Cole (1988) comment that--

> ...without clearer specifications of the nature of the schools we seek, it is not possible to specify clearly the nature of the teacher educator we seek.

In fact, traditional vocational teacher educators are concerned with what their peers in the college will think. Phelps and Cole comment that--

> Effective collaboration endeavors must be developed with key departments and faculty in the liberal arts and sciences and professional schools (e. g., engineering, business, medicine, agiculture).

Agency-operated programs of teacher preparation appear to be too short-term and too expedient. On the other hand, they probably are more realistic about the importance of occupational experience and technical competence.

Approaches

Most of the approaches are uneasy compromises. The training of new teachers in an institutional setting has to compromise on the occupational experience because of the candidates'ages. They haven't had opportunity for matuire occupational experience. Because of the need for professional preparation, the academic major is compromised, too. There isn't sufficient time to specialize.

In training occupationally competent workers from industry as teachers, a compromise on general education is usually made. The industry recruit is unlikely, after several years of full-time employment and mature obligations, to go back to college for a bachelor's degree, especially for a job that may not pay well.

In preparing academically prepared individuals with neither professional preparation nor technical competence, the problems are even greater. Unless, these individuals make a major sacrifice, they cannot, within a reasonable time, overcome their deficiencies.

Differences in Vocational Programs

The utilitarian purposes of vocational education programs, the rapidly changing content of vocational courses, and the practice-oriented methods of vocational instruction tend to present problems, if only in understanding by other educators. The purposes require heavy involvement with business and industry. The changing content requires constant revision of instructional materials. The instructional methods require provision of real equipment and supplies. These differences in programs, courses, and methods put a special demand on vocational teacher education, too.

PROMISING DIRECTIONS

There are a number of promising direction in vocational teacher education. While some of the problems, especially the bureuacratic tangles and traditional entrenchments, are not being faced, progress is being made on a number of fronts.

There is a growing recognition of the importance of vocational education and training to the economic development of a country. At least in the United States, there is widespread recognition that the key to good education and training is primarily related to instructional personnel, that teachers have not been accorded enough respect or pay, and that the best talent has been shunning teaching as a career. Steps are being taken to remedy this situation. Salaries of teachers are being increased in the belief that this will attract and keep good teachers. There is also some recognition of the fact that differential pay may be necessary to get and keep teachers in some critical areas.

Primarily because of the reform movement in the United States, serious attention is being given to better balance and more rigor in college-based teacher education programs. As a result, teacher education faculties are re-examining the professional course sequence and the nature of needed professional experiences. There is an increase in the

number of extended programs designed to increase the rigor of general studies, technical preparation, and professional education, including internships and other clinical experiences.

The concept of an educational warranty has some merit in vocational teacher education. It brings the supplier (i.e., the teacher education institution) in closer contact with the consumer (i.e., the school) and emphasizes accountability with a consequence. The growing trend to test teachers for certification may have merit, but there is great resistance by teachers' unions. The teachers' unions may, themselves, some day take on the certification responsibility. However, there is some evidence in other professions that this becomes protectionist, rather than professionally, oriented.

A number of steps are being taken to accommodate the professional preparation needs of industry-trained, occupationally-experienced persons who wish to enter teaching from business and industry. Occupational competency testing is being used as a means of granting college credit for industry-gained knowledge and skills. Performance-based teacher education modules are being used to prepare professionally these non-traditional teachers.

There also has been a growing recognition of the need to prepare vocational education teachers to meet the needs of students with special needs, to provide all students with basic academic skills and higher level thinking skills, and to impart a global perspective related to occupational areas.

In my mind, the most needed direction is yet to be taken. Vocational educators, through their own national and international organizations, should recognize the criticality of their own contribution to national development and worldwide cooperation, develop a strong set of professional and ethical standards, and become a true profession.

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BIOGRAPHICAL DATA

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EDUCATIONAL TRAINING, INDUSTRY AND COMMERCE IN THE FUTURE- A CONTRIBUTION CONCERNING THE NEEDS OF SCHOOL AND TEACHER TRAINING

Context of reference

I shall be discussing in this paper a research and development project which was begun in 1983 and is to be pursued right through to the mid-90´s. Our premiss in this project is that it is the duty of a school to prepare its pupils for life and to this end it must offer an education which is geared to modern life and its environment. This is a fundamental requirement which is acknowledged world-wide. It is surprising, therefore, that in the teaching profession, this demand is only partially fulfilled. One of the principal reasons for this, as we see it, lies in problems inherent in teacher training.

This is why our project, "The World of Work - Educational Science - Industry and Commerce", starts out from a problem which is rated more or less equally everywhere, a problem which is common to all forms of teaching degrees: the present-day theory and practice of study-courses ignores to a great extent that world for which teachers should be preparing their pupils: environment and society, the world of work as a whole, and industry and commerce. (Catchwords: "Out of school - through school - back to school"). In the face of this, the unemployment problems of young teachers (due to prevailing national circumstances) lose their significance as an object of research, inspite of the fact that many current publications focus on the very question of the employment situation.

Although our project does not exclude consideration of the employment situation, even turns the extensive range of literature on this subject to its account, it essentially constitutes research on the above-mentioned deficiency in the educational profile of the teacher. A group has been working on this project under my leadership since 1983. We have had support, right from the start, from the Amalgamated Employers´ Associations of Schleswig-Holstein (*Vereinigung*

der Schleswig-Holsteinischen Unternehmensverbände) and of the Nordmark Regional German Trades Union Association (*DGB-Landesbezirk Nordmark*). Within this context, there is also collaboration with the affiliated employee training establishments and those of industry and commerce, as well as with their research institutes: the Trades Union Institute of Social Sciences in Düsseldorf (*Wirtschafts- und Sozialwissenschaftliches Institut des DGB*); the Institute of German Trade, Industry and Commerce in Cologne (*Institut der Deutschen Wirtschaft*).

One of our aims is to mitigate the above-mentioned deficiency by means of a newly-conceived course of studies and scientific effectivity research to be applied particularly in evaluating in-service training in industry. The investigation sample has been increased progressively since the winter semester of 1984/85 and at present consists of around 200 students. Their in-service training in industry and commerce is carried out in two stages (1st stage: general in-service training in industry at the end of the second semester of studies; 2nd stage: in-service project work in industry after either the 7th or 8th semester).

The initial trials with the second stage of practical training have only been carried out since the end of 1988 in the form of case-studies. The first stage of in-service training in industry has already been carried out and evaluated in approximately 110 cases over four consecutive academic years.

Our project and the results we have so far achieved have attracted response both in the Federal Republic of Germany (for example at symposia held by the Association of North German Industrial Training Establishments (*Arbeitsgemeinschaft norddeutscher Bildungswerke der Wirtschaft*) and by the Institute of German Trade, Industry and Commerce, and abroad. Principal officers, professors and lecturers from both Eastern and Western European institutes of higher education have visited Kiel to obtain on the spot information (Warwick University/Coventry; Teacher Training College of Tallin, U.S.S.R.; Teacher Training College of Opole and the University of Gdansk in Poland). A smaller university in the People´s Republic of China (Shanxi, Taiyuan) has sent two of its students to join the Kiel project, and a delegation consisting of the Vice President and four Deans came over from there to visit the *Pädagogische Hochschule* in Kiel. I have already held several papers on the Kiel project at institutes of higher education abroad.

Our field of research will be fully established in 1989 and 1990. By this time, graduates of this new programme will be engaged in work in both teaching and other professions. The effect of the programme on the students involved and the correlation between these and fellow-students who were not involved in the programme will be investigated for both of the above-mentioned groups in the form of case-studies. Control groups from the traditional teacher training course of studies will also be examined.

A brief outline of the new training programme

Course of study

- The student registers for courses in educational science and 2 (3) specialist subjects and pedagogy of these subjects (a possible combination might be: educational studies, physics and pedagogy of physics, a foreign language and pedagogy of this subject).
- These subjects are studied on a broad basis, i.e. although the individual courses are aimed at the student's later needs in school and in the classroom, they are not aimed solely at this. (An example of a course: experimental physics, chemistry and foreign languages, leading people and chairing discussions ...).
- Right at the beginning of their studies, the students can take part in an introductory interdisciplinary course which is designed to confront them with various problems and to offer them the opportunity of meeting partners from the world of work, industry and commerce. (See Appendix 1 for details).
- In the second semester (i.e. very early in their studies, but necessary for a fundamental approach) the students on the new study programme attend an obligatory interdisciplinary course in the Department of Social Sciences, the aim of which is to prepare them for their first stage of in-service training in industry.
- This in-service training in industry takes place at the end of the second or third semester. This initially has no reference to the subjects the student is actually studying. (See below for details on trials up to date).
- The in-service training in industry is followed up by
  . a written paper of some 20 to 30 type-written pages
  . an evaluation and detailed discussion between students and professors or lecturers
  . an evaluation from both the persons responsible during in-service training in industry and professors or lecturers.
- Studies are continued through the third to the sixth semester on the broad basis described above. The *Pädagogische Hochschule Kiel* now has part-time lecturers from industry and is carrying out a programme of further education for its professors, which gives them the opportunity to exchange ideas with representatives from all spheres of the working world and industry and commerce. (See Appendix 2 for details).
- The sixth or seventh semester is concluded with the first degree papers required by the state before entry into a probationary period of teaching. This degree must be obtained if graduates wish to register for the post-

graduate degree of M.sc.paed. (*Magister* - Masters degree). I must, however, emphasise here that this final degree has not been preceded by the traditional form of teacher training, but by a form with completely new accents.

- A second stage of practical work in industry is programmed after the first degree has been passed. This now represents a confrontation with industry and commerce in which the subjects studied have specific relevance. The most important element here is that the project be based both on academic studies and on the company's work, and have a beneficial outcome for further studies and the postgraduate degree. Our trials have just begun. The *Pädagogische Hochschule Kiel* has numerous applications for students from companies all over the Federal Republic of Germany.
- The second stage of in-service training in industry is followed by a further course of studies directed towards an academic degree which will open up a range of professions for the holder.
- The main part of the *Magister* examination consists of a thesis to be written in collaboration with a company where possible, with the company responsible for the second stage of in-service training in industry. Our present plan is that the M.sc.paed. thesis should be developed from the practical and written work carried out in the second stage of in-service training in industry, thereby ensuring a continual contact between the student and the company responsible for this training right up to the end of the period of studies.

In-service training in industry and experience up to present

Together with our co-operating partners (Amalgamated Employers' Associations of Schleswig-Holstein, Nordmark Regional German Trades Union Association and the Chamber of Commerce in Kiel - *Industrie- und Handelskammer*) and company personnel managers, we have already pursued years of development work in one co-ordinating group and six separate working parties. The result is our new concept of studies, relevant examination regulations for a new academic degree and provisions for the accompanying in-service training in industry. The first students registered for this course of studies in the winter semester of 1984/85.

Apart from the reorientation of our lectures and courses, our work has up to now been focused on the preparation and completion of the first stage of in-service training in industry. So far we have successfully dealt with this four times. The following is a broad outline of our industrial training period and evaluation procedures:

- In-service training in industry is offered to all our students. It is only compulsory for those wishing to take the M.sc.paed. postgraduate degree (*Magister*).
- The preparatory course in the Department of Social Sciences

which I have already mentioned, takes place in the second semester of studies. The aim here is to awaken the student´s awareness for specific observations in the company they will be entering. Although this is not a rudimentary course in economics, the students are introduced to the basic terms and structures.

- During the semester vacation, the student spends four to six weeks in a company selected jointly by the *Pädagogische Hochschule* and the Kiel Chamber of Commerce. The student is normally introduced into several departments of the company and is looked after in each one. Usually, he is also under the guiding supervision of the personnel manager and one of the members of the staff of the *Pädagogische Hochschule*. He pays the student a visit during the course of his in-service training and discusses aspects of this phase both with those responsible in the company and with the student himself. This is at the same time an opportunity for professors and lecturers to learn something about a sphere with which they are more often than not unfamiliar.
- The in-service training in industry is, as already mentioned, evaluated and followed up. As a rule, the evaluation process, which is undertaken with contact members of the firm, is completed by the beginning of December of each year.

Up to now our expectations concerning the first stage of in-service training in industry have been wholly fulfilled. This applies for our results on the training undergone in 1985, 1986, 1987 and 1988:

- All of the companies submit positive reports on our students and declare their willingness to take on even more applicants for in-service training in industry in the years to come.
- The students speak of this experience as one which is extremely important in life. They feel at home and very well cared for in the companies. Apart from the minor upsets and initial teething-troubles involved in finding their feet, there is an overall impression that they have been a part of an estimable world which they had previously regarded with unreasonable prejudice.

Allow me to summarise this in three types of statement made by the students:

Statement type a): "...there´s a lot that´s required in industry which I can´t (yet) accomplish, but obviously I could learn a lot ..."

Statement type b): "...I have learned to respect both the company and its staff members ... "

Statement type c): "...I was amazed when I realised to what extent the staff identify themselves with their company and its well-being ..."

This, at present, small group of students which we have been able to guide through in-service training in industry, has a generating function in the seminar discussions held in the normal course of academic teaching, as the reports of their individual experiences reach a much larger group of peers.

The second stage of in-service training in industry is scheduled for students of a higher semester and has therefore only been completed in two cases. A guest student from China studying German and history as core subjects, carried out his second stage of in-service training in industry in an internationally known company whose line is medical technology. The main part of his project work was to pursue the question as to the history of a new product from the moment the idea is born, through the relevant development target data, right up to its introduction onto the market. In what way can the written and oral information required in the process best be presented, stylistically and functionally, for colleagues engaged in the development of the product, for the customer and for the ultimate users of the product, the medical staff and the patient. A German student of physics and mathematics is at present undergoing the second stage of in-service training in industry in an EDP-company with business commitments all over the world. In his project work, he is examining the question as to how the co-operation systems within the individual working team and between the entire range of working teams engaged in the production of high-technology equipment can be organised and improved. It is still too early to make any final evaluation of the second stage of this in-service training in industry. It is, however, already obvious that the companies rate the performance of our students very highly. The companies also intend to bring to bear those aspects of the case-study which are of interest for the internal running of their business. Conclusive detailed information will not be available until several students have completed this stage of in-service training in industry and the M.sc.paed. theses which are to be developed from these case-studies are finally submitted.

Research work

Our research project is pursuing a double aim. The substance of our main aim is the evaluation of this new form of training and its effects with a view to continually improving approaches to education. A further methodical aim is to incorporate the new concept permanently within the entity of teaching and research, and to break with the variables which at present dictate the employment situation of teachers. The project sets out to eliminate to a significant extent, or mitigate, the main deficiency in teacher training studies already mentioned. It should also exert a palpable influence on those students directly involved during the course of their studies (particularly during in-service training in industry) and on the postgraduates after completion of their studies (whether

they decide on teaching or other professions). This is why a record is to be taken of the actual course of a student's studies and analysed from both a curricular and a pedagogical point of view. Essential items required for our methods during the period of enquiry are documentation, case-studies on in-service training in industry and a concluding questionnaire. Our programme is conceived as a combine of project elements which is structured in such a way that the individual elements can also be dealt with relatively independently of each other.

Some of the research work on the educational profile of teachers is of a traditional nature; other parts of it have only recently been developed and reinforced in new contexts. An abundance of studies has been submitted in Germany over the past approximately fifteen years on the educational and qualificatory profile of teachers with reference to school itself, with reference to employment in other spheres, and with reference to the general social standing of the teaching profession. This type of approach has not been well-received in teacher training. The reason for this is that it was almost exclusively directed at fully graduated teachers, hardly ever at the student, and certainly never at the prospective student. These projects did, however, produce a comprehensive range of literature which was in turn evaluated for our project. Inspite of our differing approach, this nevertheless proved to be extremely useful as it enabled us to specify the above-mentioned deficiency in more detail.

We began structuring the field of research for our project in 1983 with the formation of six individual working parties and one co-ordinating group. We were fortunate in obtaining the external co-operation of members of employee and employer organisations (Nordmark Regional German Trades Union Association; Amalgamated Employers' Associations of Schleswig-Holstein). In addition to this, numerous private consultations and group consultations (personnel managers) were held with both partners from the blanket organisations and representatives from industry. As from 1984, contacts were established with the training institutions of these organisations and from 1985 with their research institutes (Trades Union Institute of Social Sciences; Institute of German Trade, Industry and Commerce).

A further measure entailed in the structuring of the research field was the reorientation of the traditional courses and lectures for the individual subjects and the creation of a new type of course for these subjects, as well as interdisciplinary courses and lectures. Contact was sought with important firms with a view to arranging means of co-operation and a share in responsibility for the students who would be confronted with the world of work. We expect to have fully completed the structuring of the field of research in 1989/90. By this time, we shall be in a position to investigate graduates of the new programme of studies in both the teaching profession and in other professions.

Research on the evaluation of the first stage of in-service training in the world of work has been underway since 1985. The students were required to submit written feedback, which was then supplemented by oral feedback in group discussions and private interviews. Oral feedback in the form of both group discussion and private interviews was further required of professors and lecturers responsible for the students, and members of the company staff. A round of in-service training in industry and evaluation for the first stage usually begins in August and is completed by the beginning of December. This has been carried out successfully four times from 1985 to 1988. (See above for details).

The wishes and decisions of the students who register for the programme vary. Some only take part in the first stage of in-service training in industry and then enter a probationary period of monitored teaching in school after the first degree, with an option to take up the programme again at a later date. Others enter the second stage of in-service training in industry as soon as they have graduated. These two samples will not be available until 1989 and after, when investigations will be carried out on the results and effects.

The research programme comprises the following items:

- Preparatory measures:
  - . fact-finding visit to in-service training firms and other companies who have had experience in taking on unemployed teachers
  - . specification and definitive programming of the documentation section
  - . specification and definitive programming of the case-study section
  - . specification and definitive programming of the questionnaire section.
- Documentation:
  - . delineation of the new or reoriented courses and lectures within the concept of studies at the *Pädagogische Hochschule Kiel*
  - . comparison with similar further education programmes offered by universities, organisations and individual companies within the Federal Republic of Germany
  - . recording of approaches in the world of work which could have pedagogic reference to the project undertaken in the second stage of in-service training in industry (management concepts, further education, representation of products to consumers).
- Case-studies:
  - . recording of individual progress through course of studies

. interviews on first and second stages of in-service training in industry with students, professors and lecturers responsible and members of company staff responsible

. feedback seminars with above participants

. evaluation of first and second stage case-studies and the M.sc.paed. thesis

. examination of teacher behaviour in the probationary stage of teacher training (class teaching projects as required for qualified teacher status)

. examination of teacher behaviour of those fully qualified teachers who are graduates of the new programme

. examination of those graduates of the new programme who have entered a different profession.

- Questionnaire

. development of a questionnaire to supplement the evaluation of the documentation and case-studies

. distribution and control of feedback procedures; if necessary further private interviews

. evaluation

- Project delineation

. annual interim reports and a final summarising report are to be prepared and published

. at the same time attempts will be made to encourage the submitting of graduate and postgraduate theses on this field of research.

Frame conditions and future prospects

The approach which I have just described has up to now been pursued in Germany by us alone. This is partly due to the fact that it runs counter to the German tradition of teacher training. For this reason alone, a considerable amount of effort is required on both the sector of educational policy and that of science and research. Handicaps such as these can only be overcome by a high degree of quality. Quality, however, can only be imparted if one sets oneself a high standard of quality every day.

This means that above and beyond the high quality standards required in the spheres of higher education, still further-reaching demands for quality must be conveyed and enforced and outwardly manifested.

May two examples suffice:

- A course of lectures on higher education and industry

Since 1985 we have been bringing together at regular intervals our professors and lecturers and representatives from the world of work and industry. This usually takes the form of a course of lectures held by experts from

organisations and business companies. (See Appendix 2 for details on the course of lectures).

- International contacts established by the *Pädagogische Hochschule Kiel*

We feel that it is important for anyone who, like the teacher, continues his adult life in his native country, to broaden his horizon. The best time to do this is during the time spent in higher education. Where this is not possible, by means, for example, of an exchange scholarship for a university abroad, the opportunity must at least be given for the student to meet peers, professors and lecturers from other countries in his own institution of higher education. Exchange is imperative. The *Pädagogische Hochschule Kiel* has many possibilities of bringing this about. We are members of the Conference of Rectors, Presidents and Vice-Chancellors of European Universities (CRE) and utilise the potential offered here to the full. We have collaboration contracts with two British universities. We co-operate with French and Dutch universities on the basis of personal contacts between lecturers and professors, and regularly have as our guests in Kiel students from the Netherlands, Estonia/U.S.S.R., Poland and the People´s Republic of China.

Among many other things, these two examples represent what we see as indispensable qualitative supportive features of our new approach.

The *Pädagogische Hochschule Kiel* advocates its approach towards a broader-based education and training for students wishing to become teachers for two reasons:

- we have in mind the professional opportunities for our graduates
- we have in mind the quality of our graduates, particularly in respect of reducing the main deficiency of teacher training ("Out of school - through school - back to school").

In implementing the new concept, the *Pädagogische Hochschule Kiel* is applying measures which follow from what I have described. May I conclude by summarising some of the frame conditions which will contribute to the success of the concept:

- we do not have to guarantee the graduate future employment in industry as a whole or in individual companies
- we do, however, have to give the graduate every possibility to acquire professional prospects in the world of work. Only on this condition can the student´s attitudes to and identification with the world of work be positively influenced.
- continual co-operation between the *Pädagogische Hochschule Kiel* and industry and the world of work are also necessary, as is the availability of places for in-service training in industry. From the student´s point of view, in-service training in industry gives him not only the chance to learn, but also to show what he can do; from the point of view of the world of work and the companies, the

opportunity to monitor the development of our students with a critical eye.

We are all well aware that poor or mediocre graduates can be very detrimental to our reputation in general, where industry is concerned, in particular. On the other hand, however, we also see that the developments in teacher training described here, and especially the ties which the teacher establishes with the wider world of work, represent a viable opportunity of enhancing the prevailing public image of the teacher, and of anticipating the future school as a school of life and environment.

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Appendix 1

Interdisciplinary seminar for first-semester students registered on the M.sc.paed. course of studies. The seminar is also open to any other students.

Education and Training, Qualification and Flexibility - Introduction to the M.sc.paed. Course of Study

1. Prof. Dr. Dahncke, Department of Physics, Rector of the Pädagogische Hochschule Kiel
   1. Presentation of the working programme for the semester
   2. Introduction to the overall topic of the seminar "Education and Training, Qualification and Flexibility - Introduction to the M.sc.paed. course of study"

2. Prof. Dr. Dahncke, Department of Physics
   Rector of the Pädagogische Hochschule Kiel

   "Teacher education and training in core subjects and educational studies - potential and limitations with respect to the world of work and industry"

3. Peter Deutschland, Vice-chairman of the Nordmark Regional German Trades Union Association

   "Profession and employment in a period of socio-technological change - presented from the point of view of the employee organisations"

4. Prof. Dr. Berge, Department of Physics
   Prof. Dr. Härtel, Department of Technology
   Prof. Dr. Walther, Department of Mathematics

   "On the relation of general education and modern technology: examples of the use of micro-electronics in school and industry. I"

5. Prof. Dr. Berge, Department of Physics
   Prof. Dr. Härtel, DEpartment of Technology
   Prof. Dr. Walther, Department of Mathematics

   "On the relation of general education and modern technology: examples of the use of micro-electronics in school and industry. II"

6. Prof. Dr. Kruber, Department of Social Sciences

"Sociological problems and methods in Marketing. I"

7. E. v. Hahn, Dipl.-Psych., Personnel Manager of Messrs Dr. Ing. Rudolf Hell GmbH
Prof. Dr. Steinhagen, Department of Psychology

"Leading people in schools and industry"

8. H. Tröger-Samland, BMW, Munich

"Further training in personnel development - report by a former teacher, now working with BMW"

9. Heiner G. Spönemann, Economist, Tannenfelde Training Centre
Prof. Dr. K-P. Kruber, Department of Social Sciences

"Invitation to participate in an industrial planning-game from the Bildungsstätte des Studien- und Förderkreises der Schleswig-Holsteinischen Wirtschaft e.V.

10. Prof. Dr. K-P. Kruber, Department of Social Sciences

"Sociological problems and methods in marketing. II"

11. Hans Heinrich Hatlapa, Managing Director of Messrs Hatlapa Uetersener Maschinenfabrik GmbH & Co., Wildpark Eekholt

"Ecology's challenge to industry - environmental protection and the teaching of environmental studies"

12. Prof. Dr. Bauer, Department of Chemistry
Prof. Dr. Detering, Department of English

"Native language, foreign language, technical language - interdisciplinary problems at school, in everyday speech and in industry"

13. Prof. Dr. Dahncke, Department of Physics
Rector of the Pädagogische Hochschule Kiel

Concluding discussions on the seminar

Appendix 2

Lecture Series: Higher Education - Industry

For members of staff of the Pädagogische Hochschule Kiel
and guests from the world of work, industry and education

1. Klaus Parmentier
   Employment Research Department of the Federal
   Institute of Employment, Nuremberg

   "Investigations and results available on alternative
   areas of employment for teachers"

2. Dr. Rüdiger Falk
   Head of the model research programme carried out at
   the Institute og German Trade, Industry and Commerce
   in Cologne on the integration of teachers into industrial
   spheres of employment; Head of the Academy of Further
   Education in Industry (FAW), Cologne

   "Qualification profile of the teacher"

3. Bernhard Doerks, Dipl. Päd.
   Former graduate of the Pädagogische Hochschule Kiel
   and of the Academy of Further Education in Hamburg
   Today, commercial manager at Messrs Meisner-Feuerschutz,
   Rendsburg

   "Graduate teachers in medium-sized business companies
   - experience and prospects"

4. Günter Bängeroth
   Director of the Academy of Further Education, Hamburg

   "Successful integration of teachers into industry"

5. Dr. Jürgen Buresch, Dipl.Ing., Dipl. Psych.
   Department of Qualification Structures and Occupational
   Psychology at BMW, Munich

   "Teachers as members of the BMW Company - experience
   gained from the model trial carried out by the
   Institute of German Trade, Industry and Commerce"

6. Eckhard v. Hahn
   Personnel Manager at Messrs Dr. Ing. Rudolf Hell, Kiel

   "Integration of teachers into industrial employment -
   advantages and limitations of their education and training"

7. Panel Discussion

   Gabriele Busch
   Former teacher, now with BMW in the Department of Education and Training/Systems, Methods and Teaching Technology

   Herr Bönisch
   From the project "The Student and the Employment Market" carried out at Munich University; representative of the Amalgamated Employers' Association in Bavaria

8. Heiner Spönemann, Economist

   Two-day seminar on managerial economics at the Tannenfelde Training Centre

   Company aims/company forms/the role of the company in society and the economy/structure and structural organisation/heads of departments report on their day-to-day work/new techniques in production and administration - effects on industry and society

9. Prof. Dr. E. Dall'Asta
   Department of Social Sciences at the Pädagogische Hochschule Kiel

   "The effects of technological change - rationalisation and the employee"

10. Jan Sierks
    Chairman of the Nordmark Regional Branch of the German Trades Union Association

    "The effects of technological change - rationalisation and the employee"

11. Dr. Wolfgang de Haan
    General Manager of the Amalgamated Employers' Association of Schleswig-Holstein

    "North-South Divide?"

12. Prof. Dr. M. Willms
    Institute of Regional Research at the University of Kiel

    "North-South Divide?"

13. Conference: The World of Work - Educational Science - Industry and Commerce

    Main speakers:
    Prof. Dr. phil. h.c. Hans L. Merkle
    Chairman of the Board of the Bosch Company

    Prof. Dr. Heinz Markmann
    Managing Director of the Trades Union Association Institute of Social Sciences (WSI)

14. Heiner Spönemann, Economist

    Two-day seminar at the Tannenfelde Training Centre

    "Schleswig-Holstein´s Industry for Environmental Protection"

15. One-day staff excursion to the Training Department of the Bremen Division of Daimler-Benz AG

16. Wolfhart Doubrawa
    Head of the Daimler-Benz AG Works Training Department, Bremen Division

    "Socio-pedagogy as an instrument of vocational training - report on the experiences of the Works Training Department of Daimler-Benz AG"

RESEARCH PRESENTATIONS

GETTING THE RIGHT PEOPLE: SELECTION OF TOURISM STUDENTS — A CASE STUDY

Colin Maddocks
School of Tourism and Hospitality
Adelaide College of T.A.F.E.

Introduction

Tourism industry's educators will continue to be predominantly evaluated by industry employers who will determine what students can do, what students need to know and how students are expected to relate to employers, clients, and fellow employees. I quote the classic marketing concept, "Our task is to get the right students, in the right place and at the right time and in the right numbers as determined by industry needs."

In order to meet our objectives we have to be clear about our definitions of right. Furthermore, we are acutely aware that we must have in place strategies to acquire the necessary funding, to develop the necessary learning resources, and to select appropriate students. There is increasing emphasis on the provision of pre-employment courses and, as a result of that, the vocational educators are increasingly involved indirectly in the selection of staff for industry. The School of Food and Catering in South Australia actively involve industry and employer representatives in the initial student selection process and view this practice as vital.

During lastyear tourism lecturers at the School of Tourism and Hospitality worked closely with the T.A.F.E. student selection project officer in developing an effective and comprehensive student selection procedure. The procedure reflects three main perspectives:

1. Applicants: The applicant has the opportunity to be better informed about the nature of tourism, employment opportunities and expectations of the School and the industry.
2. Employers: The employer is provided with the opportunity to participate in the selection process throughout all stages of selection.
3. Educators: The educators who contribute in the decision making process are better informed about individual applicants and can directly ensure that applicants have the essential academic and personality attributes required.

When faced with many more applications than places available, the task of selecting students becomes particularly critical. In the process we must ensure a high level of objectivity and take into consideration issues of suitability, fairness and equity. The procedure has been developed incorporating these principles.

The student selection procedure was successfully piloted lastyear and we share it with the intention that it may serve others as beneficially as it has served us. (The Student Selection Project is continuing in T.A.F.E. South Australia. For further enquiries please telephone Judith Haigh (08) 2263376) There will naturally be amendments in future years as experience shows us how to improve the process. Certainly we plan to correlate course outcomes with the initial student selection criteria.

Background

In order for an effective and comprehensive student selection procedure to be implemented, the following procedures were considered necessary:

1. Students need to have comprehensive information to enable some self evaluation.

2. More comprehensive information needs to be provided to applicants on both the general purpose and content of the course and the essential skills needed to successfully undertake that course of study.
3. Applicants need an opportunity to further discuss and clarify the course details in order to ensure the appropriateness of the course to their career aspirations and academic abilities.
4. Students need to provide evidence that they have these essential skills, necessitating the development of course — specific skills assessment measures.
5. Students need to have access to academic support in order to ensure the principle of opportunity.
6. Applicants who do not gain entry into the course need to be referred to further course counselling and bridging courses, etc.

Steps for implementation:

Step 1: Lecturing Staff in a specialist course met to identify the essential skills for entry into their course. (This necessitated a process manager).

Step 2: Lecturers developed a course specific skills assessment with the project officer.

Step 3: Lecturing staff met to prioritise essential skills and preferred attributes if it was necessary to screen applicants.

Step 4: Lecturers needed to prepare course information that clearly outlined:

- essential skills;
- selection criteria;
- selection procedures;
- course expectations; and
- course outcomes.

Step 5: Lecturers provided Information Evenings and interviews for course counselling in order to further discuss and clarify course details.

An Overview of the Procedures

Steps undertaken for establishing pilot selection procedures for 1987-1989

1. Introduction for staff members is: commitment to identify student selection issues and address these.
2. Project officer interviewed each lecturer responsible for each year of the relevant courses, i.e. 1st, 2nd, 3rd year and Diploma Course, Pre-Vocational Course, and Certificate in Travel Operations, and identified the essential entry and exit profiles of students in the course.

Entry and Exit Profiles

Sheets of columns of overall skills

The profiles were prepared with reference to the Global Profile of Literacy Skills as prepared by Bob Wilson and Pauline Mageean.

Global Profile of Literacy Skills

3. Preparation of Student Information handout outlining essential skills for entry and examples of the test that will be completed at the Information Evening.

Student Information

4. Information Evening:
   Course Outline;
   Industry information: and
   Testing undertaken (tests designed on essential entry skills.)

Information Evening

5. Candidates selected for interview based on Test and Portfolio results.
6. Interview Evening

   briefing of interviewers,
   listing of questions to ask, and
   checklist to complete.

7. Final panel meeting to select the applicants.
8. Applicants informed.
9. Course entry: Students referred to academic support where appropriate.

Academic Support.

THE TVEI

THE UNIVERSITY OF LIVERPOOL / NORTH WEST TVEI 16-18

CURRICULUM ENRICHMENT PROGRAMME

Henry G Macintosh

Consultant on Assessment
and Accreditation, TVEI Unit
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Department of Employment
London WC1X 8HL

The Mathematics Centre
West Sussex Institute of Higher Education

Paper presented for International Conference on

Recent Research and Development in Vocational Education

Adelaide, 12-19 March 1989

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INTRODUCTION

Ever since 1976, the government in Britain has been increasingly and directly involved in the Education System, particularly in respect to secondary schooling. This has led to a wide range of central initiatives in which the Departments of Employment and Trade and Industry have been involved, as well as the Department of Education and Science (DES). This involvement has culminated in the passing by Parliament, in August 1988, of a major Education Reform Act (ERA), originally introduced on 20 November 1987 (1). This sets out, in addition to other significant proposals relating to more open school enrolment, financial delegation to schools, the creation of grant maintained schools and city technology colleges, proposals for a 5-16 National Curriculum (2) and Associated National Testing (3). A summary of these proposals, together with the timetable for implementation for the three core subjects (Maths, Science and English) and Technology are attached as Appendices A, B, C and D to this paper.

TECHNICAL AND VOCATIONAL EDUCATION INITIATIVE (TVEI)

One of the most important of the government's initiatives was TVEI which is directed by the Training Agency, Department of Employment, formerly the Manpower Services Commission. TVEI was announced by the Prime Minister in the House of Commons in 1982. It is a curriculum initiative for the full ability 14-18 age range in full time education in the maintained sector which aims to bridge the current unnecessary and wasteful divide between the vocational and the academic. Success in this endeavour will require young people to be better prepared than is presently the case for a world which increasingly demands greater technological understanding and flexible entrepeneurial skills. There is in consequence a need for greater personal autonomy in learning, and

the capacity and will to continue to learn throughout life. TVEI thus includes planned work experience from aged 15 and regular assessment guidance and counselling amongst its criteria. It started in 1983 as a series of 4 year pilot schemes within single Local Education Authorities (LEA's), and these ultimately involved some 600 institutions and some 6500 students. In 1986, the government announced that it would be expanded from 1987 to include all full time students in maintained schools and colleges (4). In consequence, new 4 year extension proposals have to be submitted by LEA's and the overall programme will now last into the middle 1990s. The criteria which have to be met for both pilot and extension proposals are attached for information as Appendix E to this paper.

Given this background, it is not surprising therefore that the fit between courses designed to deliver TVEI criteria and existing curriculum management and assessment structures has not always been comfortable. TVEI, moreover, pre-dated the National Curriculum proposals by some four years and differs from these in some significant respects, notably in relation to the emphasis placed upon subjects. The long term influence of TVEI thus depends crucially upon a satisfactory mesh between its practice and the proposals now emerging from the National Curriculum Subject Working Parties, and there are both encouraging and discouraging signs here.

In order to help institutions and LEA's tackling the problems resulting from the introduction, management and delivery of TVEI, the Educational Directorate of the Training Agency - of which the TVEI Unit constitutes the major part - has funded over the past four years some 20 projects. These have been designed to address specific curriculum and assessment issues, and to disseminate information about these to other practitioners. The North West/Liverpool Project, as it is known for short, which forms the subject of this paper, is one of these.

THE NORTH WEST/LIVERPOOL PROJECT

The original submission was made to the TVEI Unit in February 1986 by the 13 LEA's which make up the North West TVEI Consortium, and by the University of Liverpool. A number of major industrial firms with plants in the North West agreed to participate, including ICI, Unilever and Ciba Geigy, as did the Joint Matriculation Board (JMB), Manchester, one of the six Boards responsible for examining GCE A Level, the examination taken primarily by students aged 16-19 who are aiming for higher education.

The objectives of the programme were as follows:-

1. To enrich the post 16 curriculum
   (a) through the application of subject specific skills/knowledge
   (b) by placing subject specialisms in an environment which demands business and economic awareness
   (c) by promoting the use of inter-disciplinary skills.

   The main curriculum areas to be addressed were Science, Technology and Modern Languages allied to business and economic awareness.
2. To develop a mode of learning which is project-based and which places greater emphasis on group self-managed study, and to evaluate the impact of this on student performance.
3. To promote a partnership between education and industry in which new approaches to the curriculum are developed collaboratively.
4. To promote a partnership between the Secondary/Tertiary and Higher Education sectors in which
   (a) there is a new involvement between the parties in curriculum development
   (b) the transition from Schools/Colleges to Higher Education is better understood by students
   (c) the study skills required for Higher Education are adequately developed at the Secondary/Tertiary stage.
5. To promote a framework for the accreditation and recognition of project-based learning, either through existing syllabi or through a new certificate.

A project is an open-ended experential activity involving problem solving techniques and the application of relevant skills/knowledge. As used in the North West/Liverpool programme, projects are designed for three or four students working together as a team for 2.5 hours a week for about 13 weeks.

The programme was initially funded for a two year period from July 1987 - July 1989, but a one year extension to July 1990 has been agreed in principle and is currently being negotiated. The programme is directed by Dr Roy Pegg, on secondment from the Geography Department of the University of Liverpool, whose Vice Chancellor, Professor Graeme Davis, is extremely supportive. Its evaluation is the responsibility of Ray Derricot of the Department of Education at the University. The work of the programme is overseen by a Steering Committee containing representatives from schools, colleges, industry, the University, the JMB and the Training Agency, which provides the Chair.

This paper will look at the work undertaken in the programme over the past 15 months, with particular reference to the development and delivery of projects which involve, as the definition provided earlier stresses, working in small groups (Objective 2) and to the development of assessment and accreditation (Objective 5). The impact of the work upon the relationship between schools, industry and higher education (Objectives 3 and 4) will also be considered, and an indication given of likely future work.

THE PROJECTS - DEVELOPMENT AND TRIALING

The main thrust in the early stages of the programme was directed towards the development and trialing of projects which, as was indicated earlier, were open-ended, experiential activities designed to introduce real world' problems into schools. The project briefs were developed by industrialists, university staff and teachers working together and were intended to foster the kinds of skills needed by higher education and in the work place. These skills may be summarised in four broad categories:

a) organisational skills (setting targets, ongoing review and working to deadlines)

b) interactive skills (group work, decision making)

c) information handling skills (from the library to the computer)

d) communication skills (formal and informal, group reports, presentation).

In the main, the students involved were those entering for three GCE A Levels and hence with realistic aspirations for higher education.

A major part of the Director's time in the early stages of the programme was devoted to finding industrialists, university staff and school and college staff who were willing to take part in the programme. This meant not only selling the overall programme conceptually, but convincing the various parties that there was something in it for them. For the industrialist, it could extend and inform their contacts with education, provide training for their junior managers and ensure better equipped employees in the future. For the university staff, it could secure applicants who were better able to manage their own learning and help to identify and illuminate the differences between teaching approaches in schools and in higher education. For schools and colleges, it could enhance their examination results and equip students better for both work and higher education, through increased confidence and the ability to sell themselves realistically and effectively. As is the case with any enterprise which requires people to review and change their attitudes, initial progress was slow and securing increased participation will require a continuous effort. The attitudinal problem was perhaps most acute in respect

to schools and colleges, which were concerned about the impact of the project upon A Level syllabus coverage (often overloaded) and by the initial lack of any credible accreditation for the students.

At the start, the industrialists were drawn from three major companies, Unilever Research, Bromborough; ICI, Runcorn and Ciba Geigy, Trafford. Each company allocated three managers to serve on project development teams and to prepare a particular project brief for each team. The university staff base was confined initially to the University of Liverpool and 17 different members from 11 departments participated in the first year of the programme (August 1987 - August 1988). On the school side, the first year depended very heavily upon a single school, Weatherhead High School in the Wirral, which was involved in seven projects. This was due in large measure to two individuals, the Head Sue Davies, who was an enthusiastic supporter from the outset, and the Head of the Science Department, David de Middelear, who has made a major contribution. The curriculum areas initially involved were Science, Technology and Modern Languages, allied in all cases to Economic and Business Awareness. In addition to university and school staff, the Modern Language developments involved local authority (LEA) advisory staff and the Mersey Language Export Centre.

During the period September 1987 - July 1988, 18 projects were developed for trialing. Within these there were three main modes of development:

a) those developed by schools and taken to higher education for collaboration (3)

b) those initially devised by higher education and taken to schools for further elaboration (5)

c) those developed in collaboration between industry/higher education and schools (10).

A complete list of these 18 projects together with a brief description is attached as Appendix F to this paper. Copies of some of the briefs will be available at the Conference.

The trials started in September 1988 in 11 institutions (mainly schools; the involvement of colleges of further education has so far been disappointing), with 4 others starting in January 1989. In order to ensure a balanced trial, the number of groups was restricted to one per institution, with no one institution undertaking more than four briefs. The maximum number of students in each group is four, and a specific member of the teaching staff must be assigned to each group. During the trials, industrial/academic staff will hold feedback meetings with a member of the evaluation team in attendance whenever possible. This feedback will be used to develop materials and supporting documentation.

EVALUATION

The evaluation of the programme, under the direction of Ray Derricot, is designed both to inform the day to day working of the programme in relation, for example, to possible criteria for evaluating and accrediting group work, and to provide an overall view of the work upon completion of the formal funding. The first two printed reports by Ian Taylor came out in the early summer of 1988. One was concerned with the work of two projects at Weatherhead High School over a six week period between January and March 1988, with particular reference to the group experience (5). The other evaluated a residential course held in the Departments of Mechanical and Electrical Engineering at the University of Liverpool for students from South Cheshire College between 21 - 24 March 1988 (6). This paper will concern itself solely with the first of these reports, but the author will be happy to discuss the second with those interested.

The Weatherhead evaluation study involved direct observation, casual conversations with staff and students, and the carrying out of 'semi structured' interviews with all participants. Because contact was made with the projects towards their completion, the main thrust of the evaluation lay with what had been learned rather than upon how this had come about. Whilst therefore the 'question of choice' in relation to subject area, project and fellow members of the group came up in discussion, it was only in relation to its perceived effect either upon other choices (e.g. choice of subjects viz a viz choice of project), or in relation to the operation of the project itself. The central issue was the group and how it functioned, what problems it had to resolve, the skills that had to be developed and the tasks that had to be undertaken if the project was to proceed smoothly and be written up. A particularly important aspect of the evaluation were reflections upon experience which the participants could put to use, both for themselves and for their successors.

The first message to come through strongly was that group work was helped if the members of a group reflected friendship patterns that had previously been established. Unless this was obtained, confidence in the group's collective ability to solve problems was likely to be slow to develop. The qualities needed were very dependent upon that confidence; compromise; knowing when to listen and when to speak; dealing with the unexpected, and the ability to criticise in ways which helped rather than hindered. Working through difficulties brought with it increased understanding of the importance of different roles, some hidden, some open, some determined by the nature of the project (running a company for example), and the realisation that some individuals were better at some things than others and that this did not constitute a criticism. Those involved

further appreciated that once areas of expertise had been identified, it was wasteful to change places. Some six roles were identified amongst the seven students involved in the two projects which the evaluator summarised as follows: the Technician - the Prober - the Conciliator - the Teacher or Explorer - the Supporter and the Chivvier. All these played their part at different times and in different ways, and contributed to progress.

Those involved in the projects, both students and teachers, quickly realised that they were operating in a much more natural learning environment than the classroom, in which information was not part of a teacher controlled sequence. It is therefore essential to acquire a range of self study and communication skills. There was also a recognition that knowledge was not specific to particular areas of the curriculum. (Any moves towards cross curriculum developments will thus have to make substantial use of coursework assignments within their assessment). The students also commented that the knowledge they gained through the projects was more thoroughly understood by them than was the case in the classroom. Some, but not all, projects placed a premium on manipulative and constructional skills, often neglected in A Level Science courses, particularly by girls. If something went wrong in a project, not only did the question why have to be addressed, but also how are we going to fix it when we know what it is?

All those involved felt that writing up the report was a particularly difficult part of the project and took far longer than had been anticipated. This was mainly due to the inadequate pre-planning and organisation; deciding what data to keep and how and where, and what to throw out; selecting the best form of communication for particular audiences. Possibly the most difficult task of all was interpreting the findings and drawing conclusions, and it was clear that prospective university high flyers (in terms of their A Level results) lacked the necessary skills here and needed guidance.

In their legacy to their successors, the students stressed five things which they recognised as essential and in relation to which they recognised that they lacked experience:

a) the organisation of paperwork, both earlier and more thoroughly
b) maintaining apparatus
c) sustaining a sense of urgency
d) developing strategies for effective working together - setting guidelines, regular monthly meetings etc.
e) perseverance.

It is interesting that the students evaluation coincided almost exactly with shortcomings identified by their teachers.

All those participating in the projects considered the experience to be very well worthwhile, and there is evidence of renewed interest in continuing education after school amongst those involved. Working co-operatively in groups has been one of the most positive features as perceived by the students and the following were also seen to be important:

a) a growing awareness both of self and the world beyond school

b) increased confidence to cope with situations and adults and to become independent

c) a growing sense of achievement.

On a broader front, there is some evidence to suggest that students' horizons have been widened within the contexts of the subjects they are studying; that they see their experiences not in isolation but as part of an ongoing learning process both within and outside school. The work undertaken, and indeed the whole question of TVEI itself, has forced teachers to recognise that their role is a much more varied one and involves being an advisor, consultant, development officer, facilitator, counsellor and arbiter as well as imparter of knowledge.

Further work is needed to confirm these initial findings, which are based upon a very small sample within a single school which possesses some outstanding teachers and a very supportive senior management. The experience in Weatherhead has however been replicated elsewhere within TVEI, and gives grounds for guarded optimism (7), and it is the hope that these findings will be replicated by further evaluation of project work in other institutions over the next two years.

ACCREDITATION

How best to accredit students for their achievements within the programme had always been recognised as both essential and problematic. Theoretically, there were six possibilities:

a) a school or college certificate of achievement issued by the institution, either endorsed or unendorsed

b) a certificate of achievement issued by and endorsed by the University of Liverpool

c) endorsement on existing A Level certificates by the JMB

d) incorporating the work undertaken on the projects within the JMB A Level General Studies which can make provision for coursework from a variety of different curriculum areas

e) using the Business Technician Education Council's National courses in appropriate curriculum areas

f) developing a specific new public examination.

Inevitably, the first was never seriously considered on grounds of credibility, although ironically work on Records of Achievement (ROA's) which the government proposes to introduce in 1990 for all 11-16 year olds in the maintained sector is likely in the long run to make the concept of a school certificate within national guidelines much more acceptable. As far as public examinations are concerned, GCE A and A/S enjoy high prestige but lack the flexibility to capture the kinds of outcome likely to emerge from the projects, thus creating a serious fracture between internal and external assessment. BTEC National would be much more appropriate but it lacks parental support and is in any case extremely difficult to combine with A Level (8). Britain, in marked contrast to the United States, lacks both the conceptual understanding and the assessment structures needed to operate a credit transfer system, although the recent introduction of the National Record of Vocational Achievement (NROVA) by the National Council for Vocational Qualifications (NCVQ) could bring about change (9). There was also the possibility that the latest in a long line of government committees appointed to look at A Level (Higginson), set up in March 1987 and required to report by Easter 1988, might produce proposals helpful to change.

Not surprisingly therefore, there was a degree of uncertainty about the best course of action, particularly as the criteria for assessment of group project work needed clarification - which was only going to occur as evidence emerged from trialing and its evaluation. As an interim measure, a University of Liverpool Certificate of Achievement signed by the Vice Chancellor and Registrar was issued to all who 'successfully' carried through a project brief. The requirements for successful completion were rigorous, and involved the keeping for each group of a log book of activities on a week by week basis, the preparation of a short report at the conclusion outlining progress and making recommendations for future work. These were both moderated by the project consultants, whether from industry or the university. Each group then had to give a formal presentation of their results to a peer group in the presence of the project consultants and the project Director - parents could also be involved. Finally, the individual contributions to the group had to be certified by the member of the school/college staff responsible for the project, and for this purpose a check list was developed and issued to each student. The accreditation arrangements stressed that a project report did not have to produce the perfect solution, and that there was no right

answer to most open-ended situations. All that these arrangements, which were intended to de developmental, lacked was widespread public acceptability - a sad commentary on British attitudes to assessment. The Director also initiated discussions on accreditation with the JMB, of which the University is one of the five constituent members, and ascertained that it could if asked validate the university certificate and/or endorse the A Level certificates of those students to whom the university certificate had been awarded. By this time, the Higginson Committee's report had been published (10), and its recommendations for a five subject leaner, tougher A Level rejected by the government, although its analysis of what was needed to broaden the 16-19 curriculum was accepted. Following this rejection, which was widely criticised, attention was focused on ways of realising the Committee's intentions by other means and in particular by making increased use of the A/S Level examination. This had been proposed by the government in 1984 as a half A Level which would complement or supplement A Level studies (11). It was introduced in 1986, but to date has attracted few entries. In the wake of Higginson, it was however felt to offer a real opportunity to reduce specialisation, assuming of course that you accepted the British premise that public examinations were the best way to achieve this end.

In the light of these developments and of growing understanding about group project work, it was decided to design and secure approval for an A/S. A joint working party was set up with the JMB in October and at the time of writing (January 1989) three draft syllabuses have been discussed. It is hoped to try and secure approval from both JMB and the Secondary Examinations and Assessment Council (SEAC), which has overall responsibility for examination syllabus approval, for a pilot scheme starting in September 1989, but this may be optimistic.

The model proposed is a three stage one implemented over two years. This consists of a foundation module (overall weighting 20%), two structured projects in the first year (40%, 2 x 20), and a 'major' project in the second year (40%), although the timing can be flexible. The word 'major' is used in two ways; first in relation to scope and time (it is expected to occupy some 60 hours by comparison with 25 hours each for the two structured projects), and second in its organisation. Unlike the structured projects, which had been developed and trialed by the programme, the major project is a new venture, unique to the group undertaking it. It might also be a project which required special support or resources from the university or industry which could not be replicated on a year by year basis, and in that sense was a one off. That the structured projects were based upon prepared briefs did not of course mean that there were

known solutions or correct strategies for undertaking them. It simply meant that they had been trialed and evaluated, and that support materials existed.

The overall objectives of the syllabus, of which there are currently 18, were divided into five equally weighted categories as follows:

A) Problem identification and specification

B) Determining a solution

C) Realising and evaluating the solutions adopted

D) Communicating

E) Working with others.

There is no prescribed subject matter, although it is anticipated that in the early stages most of the projects will come from the areas of Science, Technology, Business Studies and Modern Languages with a stress upon business and economic awareness. The context or contexts within which the projects operate will be indicated on the certificate. Needless to add, the question of what to call the 'subject' caused as much difficulty as anything else, but whatever title is used (Management Systems, Group Project Dynamics and Skills, Processes and Their Applications have all been suggested and found wanting) the subject contexts will be stated. The projects will be assessed by teachers and moderated by the JMB against detailed sets of criteria which are currently being developed, and will be designed to stress the individual's contribution to the group. The foundation module will be assessed orally making use of the briefs which emerged from work on the projects, and will concentrate upon individual skills, knowledge and understanding. (More detail may be available at the Conference).

It goes without saying that there are a large number of key issues which still require resolution, both in relation to securing external certification and in relation to the diagnostic and evaluative use of assessment. The first and most crucial of these relates to the establishment of an assessment/moderation framework which on the one hand accredits the teacher or industrial or university consultant, all of whom may undertake assessment, and on the other provides a quality assurance system which is not concerned with arguing about products but with the creation and rigorous implementation of systems designed to deliver appropriate quality evidence. In the longer term, the student will need to form an integral part of this process. A second major issue is the design of project briefs which will allow students to show what they can do against the criteria and produce evidence in support. In short, criteria need to be translated into practice. This is particularly important in relation to the major project, where a faulty design might gravely damage the student's overall performance or even lead to abandonment.

Resolving these issues requires the development of an on-going support system involving schools/colleges, local education authorities (LEA's), industry and higher education which can provide resources and training which are continually up-dated and reappraised in the light of experience. Whether this is possible in the context of a public examination of the kind proposed, with its inevitable bureaucratic constraints and control mechanisms, must be problematic. An ROA may well turn out to be more appropriate as an adjunct to A Level, even although its generalisability may be low. Whatever the outcome, it is indisputable that these problems require resolution if we are to develop and evaluate students who can manage their own learning throughout life and are confident and critical enough not to sell themselves short. The work on the A/S Level can only be helpful in this regard.

THE WAY AHEAD

The main areas of activity for the programme for the period to July 1989, when its original funding ends, are as follows:

a) developing and trialing further projects, including a range of new projects developed by industry

b) continuing evaluation and feedback

c) widening the industrial base to involve more companies

d) securing final approval for the A/S proposal

e) developing links with the Mersey and other Language Export Centres in order to create development teams and to prepare materials for trialing

f) opening negotiations with other Universities and Polytechnics in order to widen the Higher Education network

g) establishing and making more use of local industrial contacts in order to set up a range of permanent school/industry links.

These activities are in effect addressing a single problem, namely how to establish permanent mechanisms for linking HE, industry and schools and colleges in a continuous programme of development when the Training Agency funding ends.

Any successful resolution of this problem must take account of the major national initiatives currently affecting primary, secondary and tertiary education and look to fit its solutions into an overall strategy rather than contribute to the current wasteful and fragmented provision, particularly in respect to the 14-25 age range. These initiatives include the National Curriculum and National Testing 5-16, ROA's, school based in-service and financial management and an expansion of higher education places when student

numbers are falling demographically. The North West/Liverpool Programme cannot possibly address all these issues, but it can make a major contribution in two areas in conjunction with LEA's who have not been directly involved in the project in a formal sense to any great extent to date. The first relates to the possibility of the project work meeting the requirements under TVEI Extension in respect to work experience for all 14-18 students, at least in the last two years. Quite apart from the logistical problems facing industry in the future, much current work experience in schools has little to show for itself in terms of enhancing student learning. The expansion of well designed schemes of the kind being developed by the programme could resolve these difficulties, provided that the necessary negotiations with both LEA's and industry at both local and national level in respect to resources and management in particular are put in hand immediately.

The second contribution relates to links with higher education. Britain has never seen its universities as primarily serving the local community; they are national institutions which draw students from all over the country and outside it. Significant benefits result from this which it would be unwise to lose. The Liverpool/North West Programme has however shown that equally significant benefits in terms of flexibility and greater understanding can result from establishing local relationships between schools, colleges and universities. These are going to become increasingly important in the years ahead, as the number of students being admitted to higher education increase, as student loans become a reality and as more mature students also enter higher education. These local relationships therefore need extending on a wider basis along the lines suggested by the programme to involve say initially a dozen universities and polytechnics in the north of England. The aim would be to develop common admissions arrangements which could take specific account of rigorously assessed curriculum enrichment of the kind developed by the programme, thus obviating the necessity of developing further external examinations. It is only through arrangements of this kind, which if successful would inevitably be copied elsewhere in the country, that the present sterile circle of 'let's abolish one examination in order to create another' can be broken. The work of the programme gives cautious grounds for optimism in both areas and the extra year's extension will provide an opportunity to concentrate on them.

JANUARY 1989

APPENDIX A

THE NATIONAL CURRICULUM 5-16
A SUMMARY

The Education Reform Act (ERA) requires that all children in maintained schools in England and Wales shall with few exceptions follow a National Curriculum. This will include, in addition to Religious Education, the following ten foundation subjects, of which the three starred are to be core subjects:-

English *	**Geography**
Mathematics *	**Art**
Science *	**Music**
Technology	**Physical Education**
History	**A Modern Foreign Language +**

+ For children of secondary school age only.

In Wales, Welsh will be a core subject in Welsh-speaking schools and a foundation subject in other schools, although the Secretary of State may allow exemptions for individual schools.

It is for schools to decide how the curriculum is to be organised and taught within a statutory framework consisting of programmes of study, attainment targets and assessment arrangements. Schools will also be free to decide what else to teach beyond the requirements of the core and the other foundation subjects which it is suggested might occupy between them some 70% of a student's programme.

Subject working groups are to be set up by the Secretary of State in all core and foundation subjects. The working group in History will be appointed in January, and those in Geography and Modern Languages will follow later in 1989, in March and June respectively. The Creative Arts, including PE, working group will be set up in June 1990. Each subject working group will be asked to provide programmes of study for the key educational stages of 5-7, 8-11, 12-14, and 15-16, together with attainment targets and related assessment arrangements in accordance with the recommendations of the TGAT report for children aged 7, 11, 14 and 16. The Science and Mathematics working groups have already reported and the consultative arrangements required under the ERA prior to the issue of statutory instruments have been completed. The English working group has reported on the 5-11 phase, and the Technology working group has produced its interim report. Final reports in both subjects will be available in the early autumn of 1989.

APPENDIX A (Cont'd)

A National Curriculum Council (NCC) was established in August 1988, with its members being appointed directly on a non-representative basis by the Secretary of State. The NCC's responsibilities include all aspects of the curriculum, not just the core and other foundation subjects. Its remit covers the curriculum for under 5's and for 16-19 year olds as well as for pupils of compulsory school age. It will be taking account in its continuing review of the curriculum of ethnic and cultural diversity, and ensuring that the curriculum provides equal opportunities for all pupils, regardless of ethnic origin or gender. It will be concerned also with pupils with special educational needs. The ERA provides for the National Curriculum to apply differently in different cases and circumstances, and the Council's responsibility will include advising the Secretary of State on how and when this flexibility should be applied. In addition, it is the NCC's responsibility to advise the Secretary of State on, and if so requested by him, assist him to carry out, programmes of research and development for purposes connected with the curriculum for schools. It is also responsible for publishing and disseminating information relating to the curriculum for schools.

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APPENDIX B

NATIONAL CURRICULUM
TASK GROUP ON ASSESSMENT AND TESTING (TGAT) REPORT, DECEMBER 1987
A SUMMARY

The major features of the proposed national system of assessment for all students aged 7, 11, 14 and 16, as set out in the Task Group's report, may be summarised as follows:

1. The basis of the national system should be formative, that is to say the results should inform discussion about pupils' learning needs. There should be a diagnostic element wherever possible within the assessment. At age 16 however a more summative function should be incorporated.

2. Pupils' results should be reported in the form of an attainment profile.

3. In secondary schools there should be no more than six (and preferably no more than four) profile components for each subject or subject area within the national curriculum. At least one of these components should have general application across the curriculum- and any sub components should be based upon a common specification. Profile components should be criterion referenced.

4. Differentiation and progression from 7 to 16 should be registered on a ten point scale. This would break down into levels 1-3 for seven year olds, 3-5 for those aged 11, 4-7 at age 14 with the top four levels applying to 16 year olds.

5. Externally prescribed standard assessment tasks together with teachers' own ratings externally moderated by teacher groups would constitute the instruments for judging pupil performance. The assessment tasks should exemplify the attainment established by the national subject working groups.

6. The assessment tasks should be reviewed regularly for evidence of bias particularly in respect of race and sex.

7. A new working group should be established with shared membership between the subject groups to coordinate assessment proposals and avoid over assessment, particularly at primary level.

8. Pupils with special educational needs should be exempt from sitting assessment tasks at the discretion of heads. New materials for diagnostic assessment purposes should be developed for such pupils.

9. Results contained in a profile should be confidential to teachers and parents. They should be published only as part of a whole school report having regard to socio-economic factors. Results at age 7 should remain private to parents.

10. The GCSE should be retained but amended as the new system is phased in over a period of at least five years.

11. Extensive support materials and training should be developed and provided to help teachers relate their assessment to the national assessment targets.

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APPENDIX C

NATIONAL CURRICULUM
TASK GROUP ON ASSESSMENT AND TESTING (TGAT)
THREE SUPPLEMENTARY REPORTS, MARCH 1988
A SUMMARY

A. First Supplementary Report

This report covered the following aspects which reactions to the main report suggested needed further explanation or emphasis.

Group moderation
Aggregation of data
GCSE links
Reporting and publication
Records of Achievement
Security and confidence in results
Evaluation and review
Implications for teaching and learning
Essential features of the system

The report concluded that the principles contained in the main report constituted the only way to guarantee the following features:

i) Criterion referencing to identify specific attainment
ii) Progression and learning
iii) A formative system to guide the next stages
iv) Confidence in the results
v) Consequent improvements in teaching and learning

The final paragraph of the report summarised its overall views as follows:

"Of course it is possible to conceive of simpler systems but our analysis leads us to conclude that they would either fail to deliver what is required or prove more complex in practice as attempts were made to rectify their failings. No

simpler alternative has been put forward which demonstrably achieves all the above criteria which reflect the Government's objectives in our remit. If simplicity is nonetheless desired the question arises which of the criteria are to be abandoned and what are the implications for the implementation of the National Curriculum? That must be for others to answer. But it is our belief that the criteria are fundamental to securing those objectives, that the system we have devised to meet them stands or falls as a whole and that removal of any of its essential features would damage the implementation of the National Curriculum. Our prime concern has been to enhance the professional work of teachers so as to improve the education of our children. We remain convinced that our proposals are crucial to ensuring that the National Curriculum achieves this aim."

B. Second Supplementary Report

This second report records the outcome of discussions between the Task Group and representatives of the following subject areas:

History, Geography, Art, English and the Mathematics Working Group

The report also takes account of written responses received from six subject associations. There was general agreement by those involved in the discussion with the proposals in the main report about the structure of attainment targets and profile components, the sequence of performance levels covering progression and differentiation and the aggregation of results. The discussions did, however, lead the Task Group to suggest that

(a) Close liaison will be needed between subject working groups and others, both to secure appropriate consistency in the definition of profile components and to ensure that elements common to two or more subjects are suitably reflected in the subjects concerned without omission or duplication

(b) Subject working groups should pay particular attention to the balance of assessment in fields such as the Arts, where strands of performance are more difficult, but the Task Group believes not impossible, to appraise in isolation from the coherent whole.

(c) Working Groups may need to give priority to developing descriptions of progression covering the primary phase.

(d) The Groups should examine available assessment and testing items as a starting point for clarifying and developing thinking on attainment targets and profile components, particularly for the primary phase.

(e) The Groups should also advise on the circumstances in which different levels of aggregation of results may be appropriate in their subjects and how it should be done having regard to the general principles enunciated in the report.

(f) The Groups should suggest how particular in-service training needs in their subjects might be met.

This report concluded by stating that it might be necessary to adopt a somewhat rough and ready approach to the establishment of profile components and levels of progression for the sake of getting the system up and running.

C. Third Supplementary Report

This report presents the Task Group's conclusions on implementation, administration and support for national assessment. The report sets out the general criteria which the organisational structure for the national assessment framework should meet and the functions of each body in the system. These criteria may be summarised as follows:

(a) Clear allocation of responsibilities

(b) Optimum use of human and financial resources

(c) The system as set up and operated should have regard to its limited role because the national curriculum is but a part of the whole school curriculum and its assessment and certification and because its delivery depends on what goes on in the classroom

(d) **Coordination, including the establishment and maintenance of national assessment banks and the planning of a national INSET programme, should be coordinated by the Department of Education and Science (DES), making use of national agencies such as Her Majesty's Inspectorate (HMI), the National Curriculum Council (NCC), the Secondary Examinations and Assessment Council (SEAC) and the Assessment of Performance Unit (APU).**

The report then goes on to recommend a structure which would involve a regional tier between the national agencies and the district level teacher/moderation groups of up to twenty schools. This regional tier would consist of up to a dozen consortia in England and Wales formed by GCSE groups and LEAs in partnership and would be responsible for the coordination of assessment procedures (including moderation), monitoring and evaluation, curriculum development and relevant in-service training in their areas. The report also sets out arrangements for developing, trialling and supplying assessment instruments to schools. National coordination should ensure overall consistency between the work at the four reporting ages and the need for consistency across the curriculum as a whole.

In-service training, and in the longer term revised initial teacher training, are seen as being essential to the success of the proposals. The report proposes an immediate awareness programme for head teachers in 1988-89 and action programmes of training for primary and secondary teachers to prepare them for continuous assessment, administering standard tasks or tests as part of the national assessment bank and moderation from 1989-90 onwards, using a cascade process based on GCSE training experience. The report concludes with a case study which shows how in a typical LEA resources currently devoted to in-service training for other purposes could be substantially re-deployed in support of the national curriculum and assessment. It makes the point that the bulk of the support and training resource requirements would arise as a consequence of the national curriculum itself, whether or not there was a national programme of testing associated with it.

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APPENDIX D

IMPLEMENTATION

(Maths, Science, English, Technology)

The National Curriculum Countdown

Age Group	ACADEMIC YEAR						
	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
Key Stage 1 Age: 5–7	**September** **Maths, Science and 'probably' English** Programmes of Study and Attainment Targets introduced	**September** **Technology** Programmes of Study and Attainment Targets 'possibly' introduced **June** **Maths, Science and 'probably' English** Unreported testing	**June** **Maths, Science and 'probably' English** Reported testing **Technology** Unreported testing	**June** **Technology** Reported Testing			
Key Stage 2 Age: 7–11		**September** **Maths, Science and English** Programmes of Study and Attainment Targets introduced	**September** **Technology** Programmes of Study and Attainment Targets 'possibly' introduced		**June** **Maths, Science and English and 'possibly' Technology** Unreported testing	**June** **Maths, Science and English** Reported Testing **Technology** Reported OR Unreported testing	
Key Stage 3 Age: 11–14	**September** **Maths and Science** Programmes of Study and Attainment Targets introduced	**September** **English and possibly Technology** Programmes of Study and Attainment Targets introduced	**June** **Maths and Science** Unreported testing	**June** **Maths and Science** Reported testing **English and Technology** Unreported testing	**June** **English and Technology** Reported testing		
Key Stage 4 Age: 14–16				**September** **Maths, Science and English** Programmes of Study and Attainment Targets introduced	**September** **Technology** Programmes of Study and Attainment Targets introduced **June** **Maths, Science and English** GCSE at 16		**June** **Technology** GCSE at 16

APPENDIX E

CRITERIA FOR TVEI PILOT AND EXTENSION PROPOSALS

1. PILOT 1983-1987

In order to secure approval pilot schemes had to ensure that provision was made for

a) equal opportunities for young people of both sexes
b) a four year progressively developed curriculum for pupils across the ability range
c) clear objectives with special reference to personal qualities such as initiative and problem solving abilities
d) a balance between general and technical/vocational elements
e) a clear relationship between technical and vocational elements and potential employment opportunities
f) planned work experience from the second year onwards
g) effective links with subsequent training and educational opportunities

2. EXTENSION 1988 onwards

The extension proposals are also for four years. It is envisaged that the latest starting date will be 1991 and hence the latest finishing date will be 1995.
All submissions for extension are required to show that

a) appropriate provision has been made for transition into Higher Education
b) a technology curriculum will be provided for all students
c) the lessons of the pilot schemes have been taken on board, particularly in relation to the management of curriculum change
d) appropriate arrangements have been made for consortium working between different institutions
e) whole curriculum issues have been addressed
f) phased long term planning has been built in.

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APPENDIX F

University of Liverpool/North West Technical & Vocational Education Initiative 16 - 18 Curriculum Enrichment Programme

Project Briefs

These have been grouped according to their mode of development.

Type 1. Projects developed by school and taken to Higher Education for collaboration.

1.1 Vela Mk I - suitable for any combination of science students

Essentially an interfacing problem using the BBC Computer and VELA Data logger to produce accurate ph curves for weak acid/strong base neutralizations. This project can be modified and it is not necessary to use the VELA if you don't have one or prefer to develop your own interface.

1.2 Vela Mk II - suitable for any combination of science students.

This project takes Vela Mk I a stage further and was developed as a result of student work with Vela Mk I. It is essentially concerned with the timing and measurement problems encountered in 1.1.

1.3 **Integrating Languages with Business** - Modern Languages Groups.

This is a fact finding task, similar to that of an executive researching a potential client. For the purposes of this programme the client would be a company in continental Europe. The students would compile a dossier which would provide a complete profile of the target company.

Type 2. Projects developed by Higher Education and taken to schools for development.

2.1 **Computer Aided Learning in Physics** - Physics, Computer Studies.

A limited trial of an approach to produce CAL packages for teaching basic electronics to GCSE candidates. (Project developed by Electrical Engineering Department and Physics Department)

2.2 **Investigating Colour** - groups of science students including Physics A Level Candidates.

An interface problem involving the BBC Computer, Vela Data Logger and different light sources. This will be of interest to students looking at potential applications of the approach in environmental and life sciences. (Project developed by Physics Department.)

2.3 **Stock Control** - any combination with some input from Computer Studies.

A problem solving project built around the design and use of a stock control system. This is normally an in-house (school!) problem initially but can be extended at a later date to link to 'willing' local companies. (Project proposed by Computer Science Department.)

2.4 **Biotechnology** - any combinations of science with some botany.

A series of different projects are available ranging from the investigation of plant tissue cultures, Sauerkraut Fermentation, problems with wood preservatives and rot etc. (All developed by the Botany Department.)

2.5 **Language Thesaurus** - Linguistic, Computer science and others depending on target domain.

A cross curricular project designed to get different groups working together with the objective of producing a small user friendly, computer based Language Thesaurus of a target area of science. (The target area could be one of the other project teams.)

Type 3 **Projects developed by collaboration between Industry/Higher Education and Schools.**

A wide range of projects are being developed in this group as our Industrial Contacts increase. Initially we can offer the following but others will be available as the year progresses and it is hoped that you will be encouraged to work closely with your own industrial contacts with the same objectives. During the autumn and winter we would hope to be able to help you with such developments.

3.1 **Problems with viscous fluids** - any science area.

A project development in association with Ciba Geigy concerned with the measurement and behaviour of viscous fluids in pipes under different temperature and pressure conditions. A visit to Ciba Geigy would form part of this work.

3.2 **Chemical synthesis** -any area of science but some chemistry.

The task is to produce an Aspirin Tablet. The project involves the complete process and requires a clear analysis of costs and economic viability. Industrial visit would be involved in this project.

3.3 **Soft metal corrosion problems** - any area of science.

An investigation into corrosion problems in industrial processes. Problems of experimental error, project design and evaluation. The use of corrosion inhibitors and economic costs will also from part of the brief. Project developed in association with Ciba Geigy and visit to their research labs would complete the project.

3.4 **Reinforced Plastics** - any area of science.

Project designed by link with ICI Runcorn will involve testing of strength of materials and structures and an examination of cost benefits. Materials will be provided by ICI Runcorn.

3.5 **Biotechnology Products** - any area of science with some biology.

Project being designed in association with ICI Runcorn Biodegradable plastic - investigation of the rates of decay and conditions plus the changes in strength of material as this process develops. Materials to be supplied by ICI.

3.6 **Soil Chemistry** - science/environmental science areas.

A project to examine the problems associated with interfacing in order to make rapid determination of certain soil chemical parameters. The links between these and natural leaching processes follows. Introduction to experimental design and experimental error problems.

3.7 A range of projects are being developed with Unilever Research an example is the now well tried anaerobic treatment of wastewater. We are hoping to obtain permission from Unilever to modify this project for general release. I will send more details as they become available.

The other areas are:-

3.7a **Monitoring Hard surface Hygiene**

Using 'safe' bacteria investigations to determine effectiveness of cleaning 'work' surfaces under different conditions.

3.7b **Developing a Washing Product**

Using different fibres and dyes to examine colour deterioration.

3.7c **Development and marketing of New Personal Washing Product.**

Two groups working beside each other - one concentrating on consumer testing, packaging and marketing the other engaged on product formulation and analysis.

These projects are being developed for trialing after January 1988 and some are more suitable for experienced teams.

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JANUARY 1989

KEYBOARDING - A VALUABLE SKILL

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INTRODUCTION

As technology permeates all aspects of daily life, people will become increasingly disadvantaged if they do not have the ability to access and competently operate an alphanumeric keyboard. Accurate and rapid keyboarding skills are also necessary if people wish to communicate effectively in today's information-based society.

Competent keyboard operators do not suffer the level of frustration experienced by the "hunter and pecker". Touch operation leads to automatic responses which allow the user to concentrate on content and process rather than input manipulation. Correct techniques and knowledge also assist in avoiding health and safety problems associated with poor equipment design and inappropriate posture.

In the light of the above statements, this paper will briefly consider the following:

- What is keyboarding?
- Why learn to keyboard?
- Who should learn to keyboard?
- When to learn?
- How - methods to develop keyboarding expertise.
- What - changes in emphasis of keyboarding courses.

WHAT IS KEYBOARDING?

Keyboarding is not just another word for typewriting; but keyboarding may be part of a typewriting course.

> "Keyboarding is the first of a sequential series of stages leading to further software applications on a variety of equipment." ACETA Conference 1984 (Australian Commercial and Economics Teachers' Association) Position Paper on Keyboarding. It does not include layout, formatting etc.

Gone are the days when the typewriting course was designed primarly to prepare women for secretarial jobs. Today's keyboarding courses prepare men and women for their careers. The growing use of computers and keyboards in business, industry, government and education has made them the tools, and keyboarding a skill for many future careers.

At the ACETA Conference 1984 Keyboarding was defined as "the efficient operation of an alpha/numeric keyboard resulting from the development of correct techniques and the acquisition of relevant knowledge."

WHY LEARN TO KEYBOARD?

Australia and the rest of the world are currently in the midst of a technological revolution. More and more processes or jobs are becoming automated and there is a greater reliance on computer technology.

It is anticipated that within the next few years approximately 75% of all workers will be required to use a keyboard eg receiving and keying in information on travel, timetables, work instruction, files, etc.

Many homes already have micro computers which are used for both personal use eg leisure and personal accounts and for business eg farmers receiving weather statistics and livestock information. Information is being sent via electronic mail, both at work and at home and vast banks of data are available to be tapped by individuals as well as organisations. Students are also using computers for distance education.

It will be impossible for citizens of the future to avoid this technological revolution, so it is important that as many people as possible learn to operate a keyboard effectively.

WHO SHOULD LEARN TO KEYBOARD?

Keyboarding is becoming a basic communication skill for all. I believe everyone, both young and old should be encouraged to develop a touch entering proficiency - those in organisations, industries, and at home, employees, whether executives or on the production line; in medical, service areas, transport, education, housewives, students, etc. can all benefit by being able to access and use the growing banks of information that are available to those with the ability to tap them.

More and more careers, from entry-level jobs to top-level management positions, are expanding into and requiring the use of keyboarding. Careers requiring keyboarding need employees who can competently and efficiently enter data not only from written material but also from orally supplied material. Often the employee will be required to mentally transform the information given into a form acceptable for entry on the keyboard. A proficiency level of automatic recall of the keys is needed to free up the operator's thoughts allowing them to concentrate on the task rather than the manipulation of the keyboard. Unfortunately many people never learn to do this properly.

The integration of communications, data processing, records management and word processing equipment has given us one basic keyboard for input. All these advanced functions can be performed by people with keyboarding skills.

WHEN TO LEARN?

Keyboarding should be taught when the need arises, in other words, to be able to carry out some other task efficiently. Ideally young children should learn to keyboard in their primary school years prior to or concurrent with an initial exposure to computers. The age of introduction

will depend on the maturity, language, and reading level, together with the physical development and concentration span of each child.

It was the opinion of a majority of primary teachers taking part in the Primary Teachers' Keyboarding Inservice, (Melbourne 1984) that grade 3 students (about 8 to 9 years) was an appropriate starting point for keyboarding skills. This finding would appear to be supported by most published research, both in Australia and overseas.

It is important for keyboard users to be able to enter information at a level that is greater than their normal writing speed and at least as fast as they can think or create, otherwise they will become very frustrated. Some schools/colleges require at least a minimal level of touch keyboarding skill before students are allowed time on computers.

At present people are learning to keyboard at various stages of their education and/or work. Some learn in their primary or post primary years, others at tertiary level, or in the workplace. It is becoming increasingly common for employers to provide keyboard training for their employees, either at the workplace, or releasing them for courses in schools or colleges. The advantages gained by learning the correct techniques, far outweigh the relatively small amount of time invested in actually learning. You are never too old to acquire this valuable skill!

HOW - METHODS TO DEVELOP KEYBOARDING EXPERTISE

Keyboarding by touch generally refers to the automatic recall of the position of the alphabetical, punctuational and numeric keys without having to look at the keyboard. Teaching methods need to be quick and effective and students need to see that they are getting better.

There are three basic approaches to teaching keyboarding:

. teacher directed
. programmed instruction via a software package
. combination of a and b above

The Position Paper on keyboarding of the ACETA Conference (1984, p3) recommended that:

> In the learning period the emphasis should be on good technique. A method which rapidly covers the keyboard efficiently and which is teacher directed should be used to continually reinforce correct techniques at all times.

At Hawthorn Institute of Education I have been involved with keyboarding programs for a wide variety of age groups including:

. overseas English language students, where keyboarding, followed by a basic word processing program was used to aid language development.

. overseas students training as teachers who are ultimately required to produce all their learning materials on a word processor.

. developing and running short courses for groups from organisations and industry.

. trainee teachers in accredited courses who want to prepare professional looking student materials.

I have found that a software program, together with constant teacher input and monitoring, especially regarding ergonomic aspects - posture, seating etc has been most successful. The length of time and frequency of sessions has varied with the needs of the groups.

Great care is required in selecting the appropriate software program as some do not adequately follow desirable methodological principles in the presentation of material, reinforcement, (or lack of it), feedback, statistical data etc.

WHAT - CHANGE IN EMPHASIS OF KEYBOARDING COURSES.

The increasing importance of keyboarding skills has evolved because of the expanded use of computers at schools, colleges and in the work place, and the need to use them efficiently. The relatively short time required to teach people keyboarding in relation to the time savings which result, and the doubtful educational validity of allowing people to establish habits which are inconsistent with their future needs and physical well-being, has meant a resurgence in the demand for keyboarding courses.

The keyboard is and will continue to be the most widely used input device in communicating with computers. Voice activated computers for the mass market are coming, but not yet economically viable. Whether an executive uses a keyboard as a means of communication or a student interacts with a computer for drill and practice, the skill of keyboarding shortens input time and increases productivity.

The amount of money invested by industry, organisations, schools, colleges etc in hardware with QWERTY keyboards, plus the time needed to retrain users has meant that other more effective arrangements of keyboards such as the Dvorak keyboard and various shaped ergonomic keyboards are still not widely used.

The focus of a keyboarding course, particularly in the workplace, should be on input rather than output. Much of the data that is entered into a computer is never output in any form. For example, data entered into an electronic spreadsheet is used only for calculation of possible strategies; much of it is never printed out, or printed out selectively similarly with a data-base eg a print out of only those customers who are 30 days behind in their payments. A keyboarding course should therefore focus on the development of input skills - straight-copy skills leading eventually composition directly at the computer.

This shift in emphasis in keyboarding courses, compared to typing courses in the past, has occurred because keyboarding skills are needed by anyone who collects, uses, or stores information. High level formatting skills are needed mainly by professional word processors, secretaries and the like and are not part of an initial keyboarding program. I believe the advent of desk top publishing and the use of more graphics on computers will mean that these higher level skills will become more important in the future.

The introduction of the microcomputer for process writing in the primary school has also highlighted the need for primary students to learn correct keyboarding techniques. Not only will such training ensure their capacity to manipulate all the various keyboards they are likely to encounter in the future, but also the learning of keyboarding has some notable advantages in other areas of their learning.

A junior keyboard program should take into consideration the childrens creative, cognitive and psychomotor skills. Keyboarding has been shown to assist a student's hand/eye co-ordination; improve the quality of handwriting; spatial awareness; accuracy of spelling and also greatly facilitate the development of a student's written communication.

The timing of teaching junior keyboarding should be directly related to some sort of practical application - students should be able to gain hands-on experience at the same time and it should ideally be linked to the language program.

CONCLUSION

Keyboarding is a habit and if bad and inefficient habits are learned, they will be very hard to break. Teachers cannot afford to ignore the fact that a student who learns the 'hunt and peck' method and who later wants to acquire correct skills as part of a secretarial or computer related course, is educationally disadvantaged.

"Physical problems can be caused by bad habits which are inadvertently picked up if no instruction in correct technique and ergonomics is given. The fatigue factor, physical discomfort, loss of speed and accuracy, diversion of attention from the task and the monotony of searching for keys tends to stifle rather than free creativity." Roberts Paula, May 1985. page 5.

Schools and colleges have a responsibility to promote the health and safety aspects of computer use. Appropriate instruction and constant monitoring of good ergonomic practices, along with correct techniques will lead to major social benefits in the future.

Keyboarding, like handwriting, is a skill to be used to record thoughts, notes, data, to re-organise information, to juggle figures and to solve problems.

Keyboards are the means of access to computers for the transmission and retrieval of information and generally facilitate communication between users. I strongly believe people will, in the future, become increasingly more disadvantaged if they are unable to quickly and efficiently operate a keyboard.

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BIOGRAPHICAL DATA - JULIE COLEMAN

Currently lecturing in the Centre for Administration, Business and Welfare Studies at Hawthorn Institute of Education, Melbourne. Involved over the past five years in teaching Business and Secretarial Studies Teachers (both TAFE and post primary) in the Diploma of Education and Diploma of Teaching, Technical and Further Education. Co-ordinator of Office Technology Training at the Institute for the last four years, providing staff training and developing and running courses for organisations and industry.

12 years previous experience teaching Business Studies subjects in Victorian technical schools. Author of several typewriting books and papers on office technology training.

Qualifications include a Diploma of Accountancy, Bachelor of Business and Trained Technical Teachers' Certificate.

WORKSHOPS

The Relation Between the Results of Invention Designing Skill and Creative Thinking Skill

From the results of the various invention designing tests before instruction and figural and verbal creative thinking, creative tendencies we can obtaine the data needed. Table (3) indicates the results of mechanics and electronics students which reached $\alpha = .05$.

Table 3 Relation between the invention designing ability scores and creative thinking ability scores

subjecty		IDAT originality	IDAT useful	IDAT elaboration
Electronics	Figural-elaboration	.2164*	.3055**	.1859*
	Curiosity of CAP		.1995*	
	Imagination of CAP		.2087*	.3302**
Mechanics	Figural-elaboration	.1945*		

* $P < .05$ ** $P < .01$

From table 3 we observe that there is little creative thinking ability which has any positive relation with invention designing ability, except the figural-elaboration.

The Difference between the Enhancement of Creative Thinking and Invention Designing Skills in Mechanics and Electronics Students

The present study uses 2x2x2 three factor covariance analysis, investigating whether there is any difference in the scores on figural, verbal creative thinking ability and creative tendencies of the student's from the two subjects. The findings were that there was only a significant interaction in figural fluency.

The adjusted average scores of the two groups before & after instructions were as follows: Mechanics experimental group: 14.5–15.65; control group: 20.80–19.30; electronics experimental group: 18.99–24.11; control group: 16.76–16.86, from the adjusted means we can see that the electronics student scored significantly higher than the mechanics students on figural fluency.

Table 4 The analysis of covariance table in mechanics and electronics students on "Figural fluency" score

Source of variance	SS	df	MS	F
A (Group)	145.83	1	145.83	2.94
B (Class)	89.01	1	89.01	1.79
A x B	749.66	1	749.66	15.11**
Subj. W. groups	7,986.60	161	49.61	
C (pre-postest)	242.58	1	242.58	15.74**
C x A	604.42	1	604.42	39.22**
C x B	325.82	1	325.82	21.14**
C x A x B	59.41	1	59.41	3.85*
Subj. W. groups x C	2,496.79	162	15.41	

* $P < 0.05$ ** $P < 0.01$

DISCUSSION

Effect of Experimental Course on Creative Thinking Skill

The creative thinking ability indicated in the present study is the score of figural, verbal creative thinking.

RECENT DEVELOPMENTS IN THE TRAINING OF TRAINERS FOR VOCATIONAL EDUCATION IN EUROPE

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The present paper outlines, as a basis for workshop-discussion, some recent developments in the training of trainers for vocational education in four European countries, namely, West Germany, Great Britain, Sweden and France. But first will be presented the general position taken by the central body of the European Community associated with vocational training. Then we shall consider the case of the Federal Republic of Germany where the training of the industrial trainer has been traditional. Next we shall look at aspects of the training of trainers associated with the youth training scheme in Great Britain, with labour market training in Sweden, and with vocational training of adults in France.

Europe

A working document prepared by the Centre européen pour la développement de la formation professionelle (CEDEFOP) in Berlin in recent years emphasises the importance of the role that education and vocational training play in contributing to the economic development of the European Community, and the associated need for vocational teachers and trainers to improve their qualifications and range of experiences within a context of economic, social and technological change. This is considered applicable to trainers within companies, both part-time and full-time, public training authorities, private training organisations, and vocational schools/colleges. The role of trainers is seen to be changing in order to meet new challenges brought about by technological changes: skills have to be developed and changed, and workers have to be prepared to cope with further change. Further, the trainer has to face challenges associated with the broad expansion of training programs, particularly those aimed at unemployed youth, and at the updating and retraining of adults. Within this context the trainer is expected to possess a wide range of training competencies: technological expertise, teaching ability, on-the-job experience and social awareness.

The European Centre for the Development of Vocational Training (CEDEFOP) proposes a continuing and developmental approach to personnel involved in vocational training. It supports an increase in the mobility and flexibility within the development of trainers by providing exchanges, and experiences in other structures and environments. In order to meet the need for the continuing updating of technological, pedagogical and social skills of trainers it has been suggested that trainers should spend an average of two weeks per year in continuing (in-service) training. It is argued that priority needs to be given to the extension of existing programs and the development of new train-the-trainer programs, and training institutions (companies, public/private training organisations, and schools/colleges) must be encouraged to release trainers in order to follow courses and/or gain work experience. Financial support, it is suggested, could come from sources such as national public resources, tax incentives to participants in the training schemes, and/or taxation/'levy scheme' on companies and/or on employees.

CEDEFOP recommends that the European Community should recognise the importance of the training of trainers by insisting that requests for financial support for training programs through the European Social Fund should indicate measures taken to provide for the continuing development of the training personnel of the program; by financing specific programs for the training of trainers, and by supporting organisations which provide

release of training personnel for two weeks training per year; by encouraging exchange of information and experience among trainers at the European Community level; and by bringing together across national boundaries those responsible for the development of programs for the training of trainers.

It has also been suggested that the European Community might assist those training organisations which undertake training in order to enable trainers to raise the level of competence and skills needed by European industry and society; which use new information technologies in their training programs; which prepare trainers for training new categories of trainers such as unemployed adults and women re-entering the workforce; and which present comprehensive plans for the re-training of their training staff in order to respond to economic and social change.

The working document concludes by asking: How can the European Community contribute to the development of new and relevant programs for the training of trainers?

At this point, it is appropriate to take a look at some of the developments in the training of trainers for vocational education in Europe.

Federal Republic of Germany

In the Federal Republic of Germany the industrial trainer is called the Meister, that is, the master craftsman. In order to appreciate this role one must first look at the 'Dual System', that is, training on-the-job in industry and off-the-job at school, which is the traditional and basic system of vocational education and training. By means of this system more than fifty percent of young people each year enter into a vocational training contract or apprenticeship, usually for 3 years, in one of the 450 or so training occupations recognised by the Federal Government, whereby they receive appropriate on-the-job training in the firm for 3-4 days a week, and they are released for 1-2 days a week to attend the Berufsschule (vocational school) for appropriate off-the-job vocational education. It is the on-the-job training of apprentices in industry and commerce which is supervised by a Meister or by a tradesperson holding a Training Aptitude Certificate. Most Meisters belong either to an Industrie-und Handelskammer (Chamber of Industry and Commerce) or a Handwerkskammer (Chamber of Handicrafts). In order to become a Meister a person would have completed apprentice training to become a Facharbeiter (Industry and Commerce) or Geselle (Handicrafts), have worked a minimum of a further two years in his or her field, and have undertaken a Meister course either full-time or part-time within a vocational education establishment of the State, chamber or firm.

The course leading to the Meister Certificate comprises further training, primarily in his or her particular field, such as trade practice/theory or technical theory, and pedagogical training. The duration of the course varies from 500 to 1600 hours depending on the occupation and geographical location of the trainee. The pedagogical component covers four main subject-matter areas, namely, basic issues in vocational training, planning and implementation of training, young people undergoing training, and legal bases of vocational training. The pedagogical component is presented over a

period of time which varies from 100 to 200 hours. The assessment comprising oral and written examinations, and practical teaching is conducted by the local chamber.

Some trainers have a Training Aptitude Certificate rather than a Meister Certificate which has the same admission requirement as the latter but is awarded after satisfactory completion of the pedagogical component of the Meister program. An example, is the train-the-trainer course of Daimler-Benz at Stuttgart-Unterturkheim which leads to the status of ausbildungsmeister (trainer master craftsman). The course comprises theoretical and practical training covering legal training requirements, planning and implementation of training, developmental and learning psychology, theory of teaching and instructing, evaluation and assessment, and social educational fundamentals.

The social status accorded the Meister in both industry and wider society is indicative of the respect held in the nation for skill and training, which in turn, is considered to be the key to the economic success of the Federal Republic of Germany.

Great Britain

In Great Britain we shall focus on the trainer within the Youth Training Scheme, a two-year program open to 16-17 year old school leavers as either employed or unemployed trainees. The scheme comprises on-the-job training/planned work experience together with off-the-job training/education. These two elements of the scheme are organised and managed by Approved Training Organisations (ATOs), which may be employers, local authorities, training organisations, voluntary organisations or colleges of further education. In order for an organisation to become an ATO it has to meet ten criteria relating to the design and delivery of the training program. One criterion concerns the 'competence of staff' particularly in regard to the role of the off-the-job instructor/tutor and the work experience supervisor. According to the Training Commission off-the-job instructors should possess a good knowledge of the principles of YTS; trainer skills including program design, preparation, interacting with trainees, and assessing the immediate results of training; knowledge, skill and competence in relevant occupational area(s); ability to match off-the-job learning with trainees' work experience: while work experience supervisors should possess knowledge of the main principles of YTS; interest in young people and sensitivity to their points of view; capability of instructing and assessing young people on an individual basis; ability to safeguard the health and safety of trainees in the immediate workplace; capability of providing learning opportunities for trainees in the workplace; and knowledge, skill and competence in relevant occupational area(s). Also, Approved Training Organisations are expected to have a program of training and development for off-the-job instruction and work experience supervision which may take the form of normal in-house training arrangements, or courses and training events offered by Accredited Training Centres (ATCs).

The new one-year training program, 'Employment Training', for unemployed adults aged 18-50 years proposes an action plan for each individual comprising a package of practical training (with an employer and/or a project) and directed learning. The Training Manager provides either

directly or indirectly the planned mix of practical and directed learning. Training Managers may be employers, employer organisations, voluntary organisations, public and private sector education and training organisations, skills training agencies or employment rehabilitation services. It is envisaged that the Training Managers will need to achieve 'approved status' against criteria as need Training Managers within ATOs in the YTS. Among the proposed criteria are competence in managing action plans; designing and arranging training programs; reviewing programs; assessing and recording progress and achievement. The Training Commission states that the Training Managers will be responsible for the training and development of their own staff. On the other hand, members of staff of the Training Manager are expected to engage in a process of self-development which will be supported by the Accredited Training Centre network.

The Accredited Training Centre network consists of 56 centres located in 'host organisations' such as LEA/FE colleges, private training establishments, employer organisations, skill centres and chambers of commerce. At the present most of the effort of ATCs is to provide training to YTS staff. They deliver a range of training events to cover essential elements of the YTS such as learning strategies, guidance and reviewing, assessment recording and certification. The delivery may take place at ATCs or on client premises, and includes a variety of methods such as small and large group work, coaching and open/distance learning. These train-the-trainer activities have led to participants gaining recognised qualifications such as the City and Guilds Youth Trainers Award, the City and Guilds Certificate for Training in Training and Development, and the RSA Certificate for Vocational Preparation Tutors. In order to improve the standard and quality of trainer training ATCs provide a program of support to Local Quality Initiative projects through the production of materials and suggestion of new approaches to problems encountered by local YTS trainers. Recent development work has included subjects as Enterprise Training, Open Learning, and Special Needs Training. In addition to the current contribution to the YTS the ATCs, as noted, will be playing a major role in trainer training for the ET program, which will allow for development across both the youth and adult programs.

Sweden

In Sweden we shall concentrate on the training of trainers involved in labour market training conducted at centres of the Arbetsmarknadsutbildning (National Employment-Training). At present there are some 100 AMU Centres with 5,500 employees (mostly trainers) who instruct more than 80,000 adults each year. AMU centres provide occupational training or retraining for unemployed and potentially unemployed adults referred by regional labour market boards or companies. Each AMU centre has a training manager who is assisted by a training supervisor (or pedagogical expert) for each training block such as office administration, restaurant and catering, estate maintenance, and building and construction. The characteristics of AMU training are:

- courses run continuously;
- successive admission to courses;
- modular training system with course syllabus divided into short competence-based sections;

- training based on individual needs;
- flexible curricula responsive to regional labour market needs;
- vocational training tailored to needs of companies;
- adult education within a working environment.

A needs analysis undertaken by the Adult Education Centre at Linkoping and the Institute of Pedagogy and Psychology at the University of Linkoping, which involved managers and trainers at six AMU centres spread geographically over Sweden, formed the basis for the development of the further education (train-the-trainer) program for AMU teachers. The perceived needs of trainers were categorised into seven areas which included general pedagogy and psychology, process of teaching, student related problems, interpersonal relationship problems, program planning and student diagnosis, and organisational matters. The main areas of need were general pedagogy/ psychology and process of teaching especially with regard to learning and motivation, group dynamics, everyday life psychology, role of the trainer, individualisation, different work forms, teaching aids, presentation techniques, assessment, relation between aim, presentation and evaluation, and knowledge about research findings concerning adult pedagogy.

In addition to the needs analysis other matters provided the starting point for the personnel development (train-the-trainer) program. The first was that the program needed the support of managers at the local level in order to facilitate the performance of assigned tasks by the trainers between their theory periods. Second, was the view that education must involve experiential learning whereby there should be opportunities for application of facts and action following theory periods. Third, the program should be developed, through discussion among participants, beyond content stemming from the needs analyses to include content based on the needs of the AMU organisation and society.

In order to achieve its goals the program extends over two years comprising four separate residential weeks at Linkoping alternating with 'work at home' (hemarbetsperiod) which includes full-time teaching at the AMU centre. The residential weeks are used for theory studies while the home work periods are used for assigned readings and application tasks undertaken either individually or in groups. The readings are considered important in that they provide the trainers with a perspective on themselves as educators. The application tasks or 'experimental work' give the opportunity to test at home the ways of thinking and reasoning stemming from the theory periods and the assigned reading. The home period also provides materials for the ensuring residential period. With the alternation of residential and home periods the total program becomes more effective especially in direct application and action. In order to strengthen the connection between residential and home periods practical seminars take place at least once during each of the home periods. Supervision of individuals or small groups of trainers may also take place depending on the nature of the application tasks. A follow-up conference six months after the last residential course takes place in order to evaluate the effectiveness of the program.

In course week (residential week) one, which occurs in week nine of the academic year, educational elements are introduced which are revisited and deepened in following course weeks. The content includes:

- aims of education;

- background and presentation of needs analysis;
- presentations by course participants;
- model for educational planning;
- starting courses and introducing students;
- process of innovation in an organisation;
- role of adult education in society;
- different schools of pedagogy;
- basic view of knowledge, learning and society;
- learning and motivation;
- management/teachers' role;
- planning of home work task (introducing readings and planning small experiments);
- planning for course week two.

In home work period one course participants are expected to read parts of texts, conduct 'experiments' by observing the development of one's own students, and prepare for the next residential period.

During this period the practical seminar takes place locally, one in the north and one in the south of the country, led by an instructor from the Adult Education Centre.

In course week two (week fifteen) aspects covered include:

- microteaching;
- teaching aids;
- interpersonal communication;
- learning;
- students as resources;
- individualisation;
- everyday life psychology;
- work forms;
- 'cultural competence';
- planning for course week three.

In home work period two the emphasis is upon trying various ways of presentation in terms of work forms, and ways of working with students. Also, course participants are expected to read about personal presentation. During this period takes place the second regional practical seminar.

In course week three (week thirty-six) the content includes:

- continuation of practical-methodological experiences;
- different future seminars;
- concept and determination of educational needs;
- formulation of aims;
- development and implementation of curricula;
- development of new training systems;
- follow-up and evaluation of training.

During home work period three participants are expected to study the literature on educational planning and evaluation, and to carry out a mini-project which requires a written report. Again, participants are expected to attend a regional practical seminar.

Course week four (week forty-three) is devoted to activities such as presenting mini-projects accompanied by videorecordings and reflections, bringing together the elements of the program, and formulating action for further development, and evaluating the train-the-trainer program.

Six months later there occurs a follow-up conference with the purpose to complete program evaluation and exchange experiences.

France

The National Association for Vocational Training of Adults (AFPA: Association Nationale pour la Formation Professionnelle des Adultes) is a public organisation responsible for the vocational training for adults. Each year more than 100,000 persons participate in vocational training courses in office administration, commerce, information science, building and metals as well as in preparatory and bridging courses. In order to accomplish this purpose AFPA draws upon a staff of 5000 trainers and 500 industrial psychologists, and offers courses at 135 training centres throughout France.

Through its organisation at national, regional and local levels AFPA is able to provide interventions and adaptations to meet the needs of firms and workers in an environment of economic and technological change. The main objectives of AFPA, namely, the training and promotion of people, and the assisting in the development of firms and expertise, are embodied in its emphasis on the following activities: training; vocational assessment, guidance and follow-up; consultation and advisement to firms concerning the training and development of human resources; and research and development.

Training programs are adapted to suit the needs of each client whether they be workers in continuing training or on training leave, the unemployed, or the handicapped. For the workers AFPA offers the opportunity to gain a qualification for promotion, or to upgrade an existing skill, or to acquire a complementary skill. For the firms AFPA sets up training programs and makes jobs adaptable to technological changes.

AFPA through its Département Formation Intervention provides training for its own future trainers as well as for those from firms, and public and private training organisations by means of a modular and individualised system which operates in alternation with self-practice of training skills.

The training program, MAIP: Modulaire en Alternance et Individualisée des Formateurs, as suggested by its name has the following key elements:

- modulaire: it comprises modules able to be taken at different trainer education centres;
- alternance: it allows alternation between the trainer role at the training centre and training activities in the field;
- individualisée: it provides an individualised training program based on the experiences and needs of the new trainer.

This training program has been justified by AFPA on a number of grounds. First, it is claimed that trainers of adults in the 1990s will have to:

- develop whole packages of training activities ranging from the analysis of needs to the evaluation of performance for a population in search of qualifications either for placement or improvement;

- use varied means of training suited to clients more and more diverse in regard to objectives, prior knowledge, experiences, and learning abilities;

- work as a member of a pedagogical team participating in activities situated at the periphery of training such as the evaluation of acquired knowledge, the elaboration and execution of personalised training plans, and the preparation of pedagogical materials and methods;

- engage in continued self-improvement of one's own technical and pedagogical abilities;

- maintain within one's professional circle connections which enable the comprehension of technological and structural developments.

Second, the trainer of adults is confronted with new requirements:

- the variety of answers to individuals and firms associated with the integration of the demands of economic development and employment;

- the broadening of trades and professions, the creation of promotional channels, and the adaptation of training to technological change;

- the reconciliation between the place of production and the training establishment, between the economic decision-maker, the solicitor of training and the trainer.

Accordingly, AFPA has organised the train-the-trainer program with the following features:

- the integration of acquired knowledge and experience of the new trainer at the time of establishment of the training program;

- the construction, agreed upon by the new trainer, of an individualised path of learning leading to continued improvement;

- the use of group situations and the fostering of different aspects of the 'management' role;

- the alternation of training and action.

The initial pedagogical training is organised at the Centre of Vocational Training of Adults (CFPA) to which the new trainer has been appointed. It is here that the Pedagogical Support Group (GAP: Group d'Accompagnement Pédagogique) meets to formulate and follow through the training plan for the new trainer. This group comprises the director of the centre or another senior person responsible for training at the centre, a trainer-counsellor

from the local Pedagogical and Technical Support Centre (CPTA: Centre Pédagogique et Technique d'Appui), three future colleagues of the new trainer and the new trainer, and has a decisive role in the preparation of the future trainer.

The GAP develops the training plan in agreement among its members. Decisions involve modules to be taken at CPTAs, time to be spent at the CFPA, visits to be made to the Groupe Technique Spécialisé, to the Centre Psychotechnique, other training institutions, industrial/commercial firms, and contacts with the Agence Nationale pour l'Emploi.

As can be seen from the diagram showing an example of the path of training that the GAP meets on five occasions over an eighteen-month period having its second, third, fourth and fifth meetings at the second, fourth, eleventh and eighteenth month, respectively. At the second meeting the first assessment occurs; at the third a decision is made concerning a change in status of the trainer from sans formation pédagogique to avec formation pédagogique; at the fourth the training plan is completed; and at the fifth the final assessment takes place.

As indicated by the diagram the program contains three types of modules, namely, basic pedagogical modules (M1 - Pédagogique Generale Appliquée, M2 - Pédagogique Approfondie, and M3 - Echange et Analyse de la practique pédagogique), specialised pedagogical modules, and thematic modules. The specialised modules include such topics as 'pedagogy of pre-training - multipurpose preparatory (level V)', 'pedagogy of the pre-orientation (PJDE)' and so on; while thematic modules contain topics such as 'objectives and evaluation of knowledge acquired in vocational training', 'activation of groups in training' and 'teaching aids and new educational technologies'. The selection of specialised and thematic modules is negotiated with the GAP. In addition to pedagogical training there is complementary technical training which is negotiated with the Groupe Technique Spécialisé from the CPTA.

Further, the program allows for the acquisition of knowledge of the environment of the training centre (institutional, economic, employment), and the progressive assumption of teaching supported by colleagues sitting at the GAP and assisted by a document of self-instruction called the Guide Pédagogique.

The new trainer is expected to complete a training booklet (livret de formation) which among other things contains the training plan together with complements and rectifications, the decisions made by the GAP concerning training between present and future GAP meetings, and evaluations of actions between present and previous GAP meetings. Also, the new trainer has to maintain a doisier d'aide à la formation which is a documentation of information, observations, reactions, ideas and suggestions, and a doisier d'aide à la evaluation which comprises self-evaluations of the acquisition of desired competences. These activities provide the basis for the pedagogical project.

On the recommendation of the GAP the new trainer is awarded the Certificate Formation Pédagogique (CFP) from the CPTA.

Questions for Discussion:

1) What are the competences needed by the trainer today?

2) What is the most effective structure for train-the-trainer programs?

3) What should be the balance between pedagogical and technical content within the programs?

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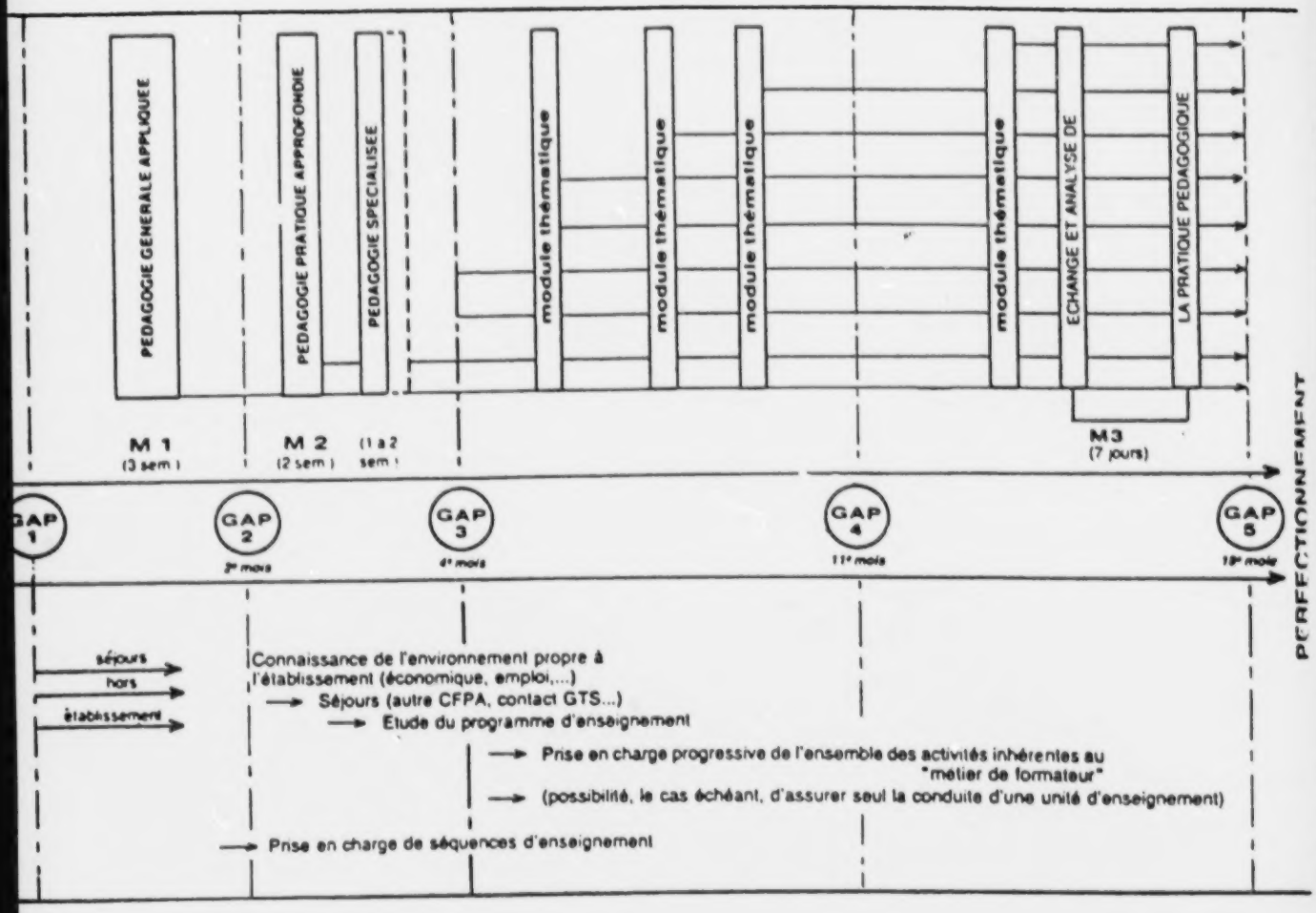
Exemple de parcours de Formation M.A.I.F.



MODULES PEDAGOGIQUES DE BASE

- M 1 Pédagogie Générale Appliquée
- M 2 Pédagogie Pratique Approfondie
- M 3 Echange et Analyse de la pratique pédagogique

MODULES PEDAGOGIQUES SPECIALISES

- *atelier d'entraînement à l'acquisition, la remise à niveau et à la révision des savoirs abstraits*
- *pédagogie préparatoire multifilières*
- *pédagogie de la simulation*
- *etc...*

MODULES THEMATIQUES COMPLEMENTAIRES

- *objectifs et évaluation des acquis en formation professionnelle*
- *l'animation des groupes en formation*
- *aides pédagogiques et nouvelles technologies éducatives*
- *etc...*

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DISTANCE EDUCATION, MID-CAREER UPGRADING AND TAFE-HIGHER EDUCATION ARTICULATION

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Introduction

Two major social changes in recent years are requiring educators to look more deeply into alternative educational opportunities for adults. One is the decreasing birthrate in western societies and consequent increasing proportion of adults in the population. The other is the changing workplace and its escalating demand for retraining, upgrading and recurrent education. Through measures such as improved mature age entry, development of graduate coursework awards, and a rapid expansion of distance education, the opportunities for formal study by adults have expanded considerably in both TAFE and higher education. Nevertheless, a traditional divergence has persisted, in that opportunities to progress from TAFE onto higher education are limited or are underutilised.

This paper is a progress report for a study centred on the concepts of articulation between TAFE and higher education, and mid-career upgrading, linked to distance education as a mode of study in which we could expect to find illustrative examples. Articulation is "the process of achieving access to education and of gaining status or credit in one tertiary sector for study and experiences gained in another, in less than the compound duration of the courses undertaken" (Young, 1988). As Parkinson (1985), Parkinson, Mitchell and McBeath (1986, p3-8) and Young (1988, p145) have pointed out, articulation is a broader concept than credit transfer granted on an individual basis. Articulation is linked to the view that post-compulsory education should provide a continuum of opportunities, and can be linked further to needs for advancement during a person's working life. This is mid-career upgrading, which refers to the demands for additional knowledge, skills and responsibilities that are imposed on persons by or for their promotion within a typical industrial, commercial or public sector organisation. The facilitation of this type of occupational mobility is one of the major purposes of articulation between TAFE and higher education (Mathers, 1981).

This study also seeks to assess whether there is any significance in these concepts as a basis for an alternative pathway into higher education, and for understanding an important source of distance education enrolments. The traditional pathway is an immediate continuation from secondary school completion into higher education, a pathway followed by approximately 41% of Year 12 school leavers (Dawkins, 1987, p14). About 20% of Year 12 school leavers enter full time TAFE study, and it is on behalf of this group, together with part time and mature age students in TAFE, that interest in alternative pathways should be promulgated. Whilst many or even most may be satisfied with their initial vocational education, many others will at some stage in their employment history be seeking a mid-career upgrade which requires a

convergence with higher education. In the words of the Green Paper, we must recognise "the importance of students being able to progress along the educational continuum" (Dawkins, 1987, p38).

Policy and practice issues

The recent Green Paper (Dawkins, 1987) and the White Paper (Dawkins, 1988) on higher education reiterated the importance that the Federal government perceives for improved articulation between TAFE and higher education. On the specific issue of credit transfer the White Paper stated :

> Refusal to grant credit for successful completion of an accredited post-secondary course is inefficient and discriminates against some groups traditionally under-represented in higher education, particularly those with TAFE qualifications ....
>
> There should be continuing dialogue between higher education and TAFE institutions to establish means by which co-operative planning of TAFE courses .... may facilitate credit transfer. In particular, attempts to move to higher education on successful completion of TAFE awards must be made easier for those students who wish to upgrade from para-professional to related professional awards (Dawkins, 1988, p35, 37).

Major issues in articulation have been identified by a number of recent studies and commentaries, including several funded by the Commonwealth Tertiary Education Commission (CTEC) prior to its restructuring into the Department of Employment, Education and Training. From the work of Parkinson (1985), Parkinson et al. (1986), Bardsley and Gallagher (1987), Lloyd and Standish (1987), Bradley (1988), Young (1988), Stevenson (1988), and McBeath (1988) we can list the following difficulties:

* higher education admissions practices which may be perceived by TAFE award holders as restrictive, unsympathetic and providing insufficient information

* lack of appropriate modes of study due to insufficient offering of external courses or timetabling of classes to suit only the full time student

* inadequate credit for previous study, inconsistent practices in granting exemptions, and the absence of recognition of work experience, resulting in frustration due to excessively long periods of part time study

* in some fields of study (such as engineering, cited by Lloyd and Standish, 1987) employers may not provide promotional pathways and incentives for employees to upgrade from para-professional to professional

* a cluster of fundamental issues relating to the underlying origins of the issues listed above, including, for example, questions about "a different kind of knowledge" and the "conceptual depth and rigour of TAFE courses" (Hudson, 1986, p6-7); curriculum problems relating to the structure and integrity of TAFE awards (Dawkins, 1987, p38; Mathers, 1981, p350; Young, 1988, p151); judgements for the competitive selection of school leavers and TAFE graduates for faculties subject to quota (Parkinson et al., 1986, p30); and sociological barriers (Young, 1988, p151).

Whilst many considerations influence perceptions of the significance of these issues, one factor is the number of students involved. On this basis, some opinions are dismissive, as the now disbanded Universities Advisory Council reported in 1987 :

> If transfer from advanced education to university is difficult, transfer from TAFE to university is so rare that it deserves special mention when it occurs. One university, whose student load is relatively large, made special mention in its submission that in 1986 a TAFE student gained credit for the first year of the Bachelor of Engineering degree for work done towards two TAFE diploma courses (CTEC, 1987, p28).

Yet between 1980 and 1983, over 15000 students with a TAFE qualification as their previous qualification were admitted to higher education, including over 4000 to universities (Parkinson, 1985). In 1985 over 3000 students in this category commenced advanced education (CTEC, 1986, p219; Anwyl, Powles and Patrick, 1987, p48). These numbers of students, although a small proportion within the total higher education system, cannot be dismissed.

The significance of articulation issues will obviously be greater in the circumstances - institution, field of study, availability of part time and distance education modes, favourable occupational environment - that are likely to be more attractive to the students or potential students in question. Case studies on articulation are unlikely to be useful in the large university which granted credit to "a TAFE student". The target group is much more likely to be found among part time and external students and in the institutions which have a particular commitment to these modes. An important lead can be gained from the study by Anwyl et al. (1987, p43-50), which suggested that the proportion of part time and external higher education students who commenced on the basis of a TAFE qualification is in the range 6 to 20%. The proportion could be higher than officially identified, and there are indications from surveys of TAFE graduates that the unmet demand could be significant (Bardsley and Gallagher, 1987). Our knowledge of this group is imprecise, with an even larger deficiency in knowledge about potential new students who in the future may be attracted into higher education, either to upgrade an existing TAFE qualification, or to continue studying after having developed confidence through TAFE further education courses. The significance of articulation issues cannot be assessed by looking only at the experiences of several years ago because we have to anticipate the pathways required by future generations of students.

Choosing illustrative case studies

On the basis of the background outlined above, we commenced this project by selecting a context which could be one of the most favourable for case studies to illustrate the problems and the potential in TAFE to higher education articulation. This meant choosing the external or distance education mode of study, which minimises an important barrier for adults with employment and domestic commitments. A further consideration was the selection of fields of study in which barriers to occupational mobility may be less significant than, for example, those discussed by Lloyd and Standish (1987, p51-54) in relation to engineering, and in which the prospects for growth in employment and upgrade requirements may be more favourable.

The initial selection was Bachelor of Business at Curtin University and Bachelor of Science (Computer Science) at Murdoch University. In each case the institution is the sole provider in Western Australia of distance education in business and administration, and computer science respectively. The main disadvantage about selecting these disciplines for further investigation of articulation issues is that in both cases the number of qualified applicants exceeds the number of places available. Therefore there is the potential problem of unmet demand impacting more severely on the non-traditional applicants for places. Bridging coursework for new students is not a problem, because for those who do require bridging, usually in mathematics, appropriate study is available from TAFE in after hours classes or from TAFE External Studies College of WA, or elsewhere. Curtin Bachelor of Business students with a completed TAFE associate diploma (UG3) level qualification receive block credit (Dawkins, 1998, p35) for first year, whilst at Murdoch TAFE award holders with grade average B or better receive specified and unspecified credit (Dawkins, 1988, p35) up to 12 points, which is half of first year. With the Murdoch students there are in practice relatively few difficulties in utilising the unspecified credit, because the typical first year programme permits a reasonable number of general elective units. The amount of credit granted by Curtin appears to be generally comparable with practices in NSW, whilst Murdoch's policies are less liberal (NSW Department of TAFE, 1987).

Investigation of Curtin University external students commenced with an exploratory questionnaire (McBeath, 1988). This was sent to all Curtin external students in order to assess whether other fields of study besides business and administration would be suitable also for more extensive investigation. Education students were omitted because Curtin is the Western Australian provider for the main relevant group, TAFE lecturers studying internally or externally for their initial teaching qualification, which is an articulation designed specifically for them. The questionnaire identified clusters in Bachelor of Arts (Social Sciences) and Bachelor of Applied Science (Nursing) which warrant further surveying in addition to the Bachelor of Business cluster. One of the most interesting factors to study further is the extent to which TAFE courses attract people into a resumption of formal study, through an awakening of latent interests and abilities, and the stimulation of confidence.

Investigation of Murdoch University external students commenced with manual searching of External Studies Unit file notes relating to enrolment counselling advice for external students in Computer Science. A preliminary count for 1988 enrolments showed that at least 24% of these students (N=70) had completed some TAFE study. This is a higher proportion than found in other studies cited above and it may increase as the study continues. Counselling records are not available for all students and telephone follow up is continuing. The computerised student records relating to previous educational experience are incomplete, as there appears to be a tendency for

TAFE qualifications or partly completed TAFE study to be undeclared during admissions procedures and the annual collection of statistical information through the annual enrolment form. This problem was noted also with the Curtin investigation. As with the Curtin group, observations on the Murdoch group suggested that the scope should be widened, for example to detect the enrolment of students who had participated in a NOW (New Opportunities for Women) program at a TAFE college.

Continuing directions

This project is continuing at both universities. The problem of identifying previous TAFE study is now easier, as a result of improved enrolment form questions for collecting 1989 official statistics relating to previous education. The work to date has confirmed the importance of TAFE-articulated students within the external student body. The immediate priorities are to monitor over several years the size of this group and their performance, compared with other groups.

As some studies not involving the external mode have indicated undistinguished graduation rates for TAFE-articulated students (Bardsley and Pauley, 1987; Quirk, 1988), it is important to assess whether the distance education mode can provide any improvement. Also, it is important to determine in detail the nature of the various relationships between previous TAFE study and current higher education study, whether a mid-career upgrade, or preparation for a new or resumed career.

There are no immediate plans for this project to lead to specially designed course articulation arrangements comparable to the advanced examples now appearing, such as in library and information studies (Lane and O'Brien, 1987), and urban horticulture (Stevenson, 1988, Appendix 4). However, distance education practitioners in higher education are certain to become more aware of articulation issues, and the potential flexibility that can be brought to articulation by the use of distance education methods. This flexibility lies in the scope for minimising barriers due to students' employment or domestic commitments, and in the scope for specialised curricula which can be offered statewide or nationwide.

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TITLE: ***ENGINEERING EDUCATION - PROBLEM SOLVING IS A STRATEGY THAT APPEALS TO GIRLS .***

NAME: ***JASMINE PAYGET, BSc.***

Engineering as a profession often presents only the technocratic front and therefore limits its ability to attract students both girls and boys. This paper suggests that engineering could be considered more interesting by secondary school girls if other aspects of the profession were emphasized and if althernate teaching methodologies were employed in first year.

The Institution of Engineers Australia argues that for an increase in engineering graduates to occur, women will need to be strongly recruited. What is the best way to introduce women to engineering? How could we get across the basic concepts in engineering to people who have rarely heard the word? What would be the best way for students to learn about the way science is applied in industry? In an attempt to answer these questions, the S.A. Institute of Technology held the 1987 Vocational School in Engineering and Technology for Year 10 girls.

What was the Vocational School?

It was a three day workshop to introduce Year 10 girls to the concepts and building blocks of engineering and applied science courses. It was hoped that by actively engaging the girls in solving problems - similar to those they may encounter once studying engineering or applied science - they would be so motivated that they would study maths and sciences at school with a renewed vigour or at least keep their career options open by continuing to study maths and sciences to matriculation level.

Those were the expectations. What actually happened? We began by asking the participants what encouraged them to consider engineering and technology as a career area and what was currently discouraging them. Some of the more common factors identified were:

Encouraging	Discouraging
Well paid	Hard work
Challenging	Difficult concepts
Not routine	Intimidation by males
Opportunity to travel	Travelling
Satisfying	No social life
Support by teachers/parents	Lack of support
Fascinating	Worried about failing

For the course specific sessions the young women were divided into groups of 9 or 10 and groups were named: Mary Somerville, Rachel Carson, Marie Curie, Barbara McClintock and Eleanor Baum (1). Each student attended sessions in the following disciplines: Civil Engineering, Mechanical Engineering, Electronic and Electrical Engineering, Chemical Technology, Applied Physics, Applied Geology, and Metallurgy.

Problem-solving

During our planning for the Vocational School we had several discussions on "problem-solving".

> There are two quite different interpretations of the meaning of "problem-solving". On one hand the term is used to describe problem-solving as it commonly occurs in a mathematics or chemistry class. This is tightly defined. The number applicable techniques is quite small and the student's task is to apply the appropriate one of these to get the answer. On the other hand, the phrase "problem-solving" refers to a process addressing broader, more loosely defined problems, amenable to many possible approaches, several of which may give different solutions and which might be evaluated in various ways. both forms of problem-solving are important . . . . but the former tends to be emphasized in the early stages of courses in higher education while the latter plays a larger role in the later stages and dominates the work of the professional. (2 - Kay et.al., 1987)

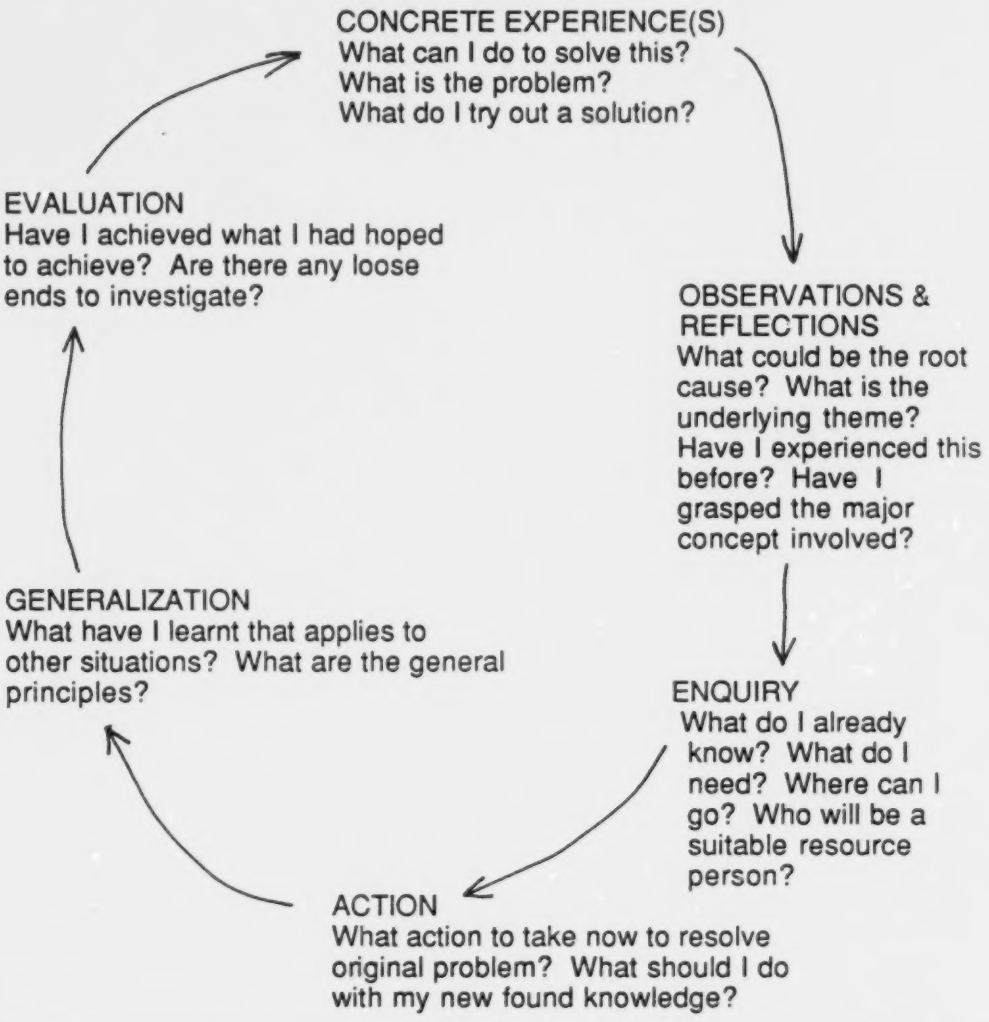
The aim was to devise a problem that was able to be solved by year 10 girls but that would also illustrate the way in which problems are solved. Students are often expected to 'solve' the problems at the end of chapter in the text book but these Vocational School sessions were an attempt to put a new learning cycle in place. (See Diagram 1)

The Civil Engineering exercise began at a concrete experience, literally! The Year 10 students were presented with a problem to solve: they were to use pine planks to support a heavy (428 kg) concrete block, i.e. to build a simple bridge.

The Year 10 girls responded well: *I was asked to do something I've never even thought about before"* .They perceived the problem in different ways and then had to quickly sort out a way of solving the problem as a group. One group tried to work out a formulae for the problem and one group tried to place the planks in an 'under and over' or woven pattern. After some trials most were successful: with 6 or 8 planks. The problem was solved. Yes, but. . . engineering is also about solving a problem for the lowest cost or, in this exercise, with the lowest number of planks. What would be the minimum number of planks?

The students moved to the next step in the Kolb Learning Cycle - Enquiry - where planks were tested to destruction and they could record the amount of force it took for the plank to break.. They learnt that it was not merely the strength of the plank that mattered but where the flaws in the wood were situated. .*"The unexpected happened"*.. .With this new knowledge the students were invited to try the problem again. They now were able to use their knowledge not only of the strength of the planks but also utilize the flaws in the planks to build the bridges quite differently.

Diagram 1: Kolb Learning Cycle (3 - Kolb, 1979)


CONCRETE EXPERIENCE(S)
What can I do to solve this?
What is the problem?
What do I try out a solution?
OBSERVATIONS & REFLECTIONS
What could be the root cause? What is the underlying theme? Have I experienced this before? Have I grasped the major concept involved?
ENQUIRY
What do I already know? What do I need? Where can I go? Who will be a suitable resource person?
ACTION
What action to take now to resolve original problem? What should I do with my new found knowledge?
GENERALIZATION
What have I learnt that applies to other situations? What are the general principles?
EVALUATION
Have I achieved what I had hoped to achieve? Are there any loose ends to investigate?

At the stage of "Generalization", this session finished. It was hoped that the students would individually consider the general principles that related to problem-solving in an engineering context. There will be a clearer monitoring of this next stage during the 1988 Vocational School where it may be possible to develop the evaluation aspect of the learning cycle. Problems are posed in quite different ways by different disciplines and it would be interesting to check if students perceive a common thread.

In terms of overall evaluation, anecdotal evidence suggests that students who attended the Vocational School have become much more interested in their maths and sciences subjects. This is to be followed up by checking Year 12 choices at the beginning of 1989.

Conclusion

Is this approach any more girl-oriented than boy-oriented? I argue that it is useful for both girls and boys but that is particularly attractive for girls given that "Girls tend to like to explore how things function, to create things themselves, to use their curiosity, doing practical work, to see application in industry and everyday life".(4 - Harding, 1983) and (5 - Head, 1985). The

sessions in Chemical Technology used everyday applications such as making toothpaste. Given the low participation rates of women in engineering and some of the applied sciences it is important to address issues that directly affect or interest girls as well as choosing learning patterns which include girls to a greater extent.

Girls-only group were seen to be important because we wanted to ensure that girls would feel comfortable about doing the practical work. Also, girls who are subject to peer and family demands to do a 'feminine' job were able to see that many other girls are interested in doing something a little different for girls.

Girls also have a number of informal skills which would be useful when working as an engineer; such as communication skills, developed interpersonal skills and a concern about the impact of technology on humans. These skills are becoming increasingly valuable in an engineering context as engineers tend to become senior managers after 8 to 10 years and certainly must either manage technical staff or work in a team in most industrial jobs.

If there are a number of students whose preferred learning cycle is different from that of those currently studying engineering and applied sciences, perhaps there is a need to consider what is wanted in the educational process. "An education system that constantly delivers accomplished facts for student consumption, fails to deliver the empowering experience of learning how to function in [innovative] environments." (6 - Seeley, 1986)

An interdisciplinary, project oriented approach in engineering and applied science education would be likely to attract and retain larger numbers of women.

Jasmine Payget
November1988

I thank my colleague, John Argue, Principal Lecturer in Civil Engineering, who devised the session described and has a critical role in the formulationof the Vocational School. Acknowledgements also to Kerry Cochrane, Hawksbury Agricultural College, for his discussion on the Kolb Learning Cycle.

End notes
(1) Mary Somerville was a 19th century physicist; Rachel Carson wrote "The Silent Spring" in 1962; Marie Curie was a Nobel prizewinner in Physics; Barbara McClintock is a Nobel Prizewinner in biochemistry; and Eleanor Baum is a Dean of Engineering in New York, U.S.A..

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(5) Head, John, The Personal Response to Science, Cambridge University Press, Cambridge, 1985

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(7) Concluding remarks about the Vocational School
The remainder of the Vocational School consisted of visits to industries where, on the most part, women engineers or scientists were able to guide them around. wearing hard hats was a real adventure, though safety glasses were not so popular. The response to the three women speakers - a final year student, a third year student and a graduate of the associate diploma course - during the last session indicated that role modelling is important. The speakers were enthusiastic about their chosen careers and courses of study. The need to keep options open by studying maths, physics and chemistry to matriculation was emphasized.

The Vocational School for Year 10 girls was organized because Year 10 is a critical year in terms of making maths and sciences choices. While it may be preferably to work with younger girls as many decisions are already made by the end of Year 10, it does offer a chance to counteract the stereotyping to which 15 year old young women are vulnerable. I was able to organize the Vocational School as part of project work of the Equal Opportunity Unit, S.A. Institute of Technology, Adelaide, South Australia. Academic and general staff took on extra work as part of an increasing awareness of the role a tertiary institution can play in aiding equal opportunity in the community.

RECENT RESEARCH AND DEVELOPMENT IN VOCATIONAL EDUCATION

Conference theme: Equal Opportunity in Vocational Education.

The development of access mechanisms to vocational training for people of Non English Speaking Backgrounds.

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RECENT RESEARCH AND DEVELOPMENT IN VOCATIONAL TRAINING

CONFERENCE THEME: EQUAL OPPORTUNITY IN VOCATIONAL EDUCATION

INTRODUCTION/OVERVIEW

The intention of this paper is to examine the disadvantage faced by migrants of Non-English Speaking Background (NESB) in relation to access to employment and to vocational education/training programs as a precursor to employment. To do this topic justice I will place it in the context of what is currently occurring in the Australian economy and the strategies adopted by the three main players in the process of structural adjustment with respect to employment, education and training.

DEMOGRAPHIC TRENDS

The Australian Bureau of Statistics (ABS) has projected population growth through to the year 2031. In determining results, the ABS has assumed 4 scenarios. Briefly overall population will grow at a declining rate to year 2031, and for all scenarios very low population growth will occur in the last ten years of the forecast period. These results highlight Australia's ageing population. The implications are that the percentage of younger people to total population will fall. These projections include overseas immigration levels of around 140,000 per year for the next 40 years. **1**

This ageing of the Australian population will cause significant changes in the composition of the labour force. They suggest a shortage of labour in the recruitment ranks (15-24) for all employers. This means there will be increased competition between employers to recruit or retain staff. This has important implications for industries subject to new technologies and growth in employment such as the service industries. The shrinkage of the labour force is occurring in a period of employment growth in industries which will make Australia internationally competitive. The drive to achieve an increase in competitiveness is of concern to unions, employers and government alike. The need to shift economic activity to greater production of value added goods and services is also the location of the debate of the investment in human resources and the importation of skills via the Federal Government's immigration policy.

"The Occupational Share System is an integral element in the Government's overall economic policy. Labour shortages may constrain the ability of Australian industry to become competitive through effective use of resources, improvements in the quality of its goods and more effective exploitation of technological developments." **2**

The OSS is a part of an integrated skills formation planning strategy designed by both the Federal Ministers for Immigration, Local Government and Ethnic Affairs and Employment, Education and Training. The problems concerning this category of immigrant will be addressed later in the paper.

The focus of this paper is to consider equality of opportunity of access for people of NESB to employment and to both training and retraining as they relate to both labour market policy and industry policy.

EQUITY AND EMPLOYMENT, EDUCATION AND TRAINING

"Equity of access to education and training is an essential component of the Government's overall strategy to bring about social justice. It is through the acquisition of skills that disadvantaged groups can gain access to jobs and improved economic prospects." 3

For the purposes of this paper disadvantage as it relates to people of NESB means:

a. those with poor English language skills
   and
b. those who are subject to cultural barriers to employment.

This two fold definition of disadvantage is difficult to address in a single training program as it encompasses the specific cultural nature of Australian working environments and the consequent adjustments required by NESB immigrants who have extremely diverse backgrounds.

COMMONWEALTH INITIATIVES

The Commonwealth Department of Employment, Education and Training (DEET) has the responsibility of pursuing an integrated approach to employment, education and training policies and to ensure that these are located in and appropriate to the changing social, economic and industrial environment. Rather than exploring the gamut of education/training programs I wish to concentrate on two areas that are of immediate importance to people of NESB.

With the imperative for life-long skills acquisition and the above comments on the need to fully utilise human resources, English language skills are being viewed as an integral component of skills formation:

> "English language training programs should be available for all workers enabling them to participate without discrimination in all training and retraining programs resulting from award and industry restructuring." W Kelty, Secretary, ACTU 14.11.88.

This comment is echoed by employer groups as well as governments with the recognition of the centrality of language training to ensure access to other forms of training and to employment.

The Adult Migrant Education Program (AMEP) is part of the Commonwealth Department of Immigration, Local Government and ethnic Affairs (DILGEA). The AMEP has a needs based philosophic approach and as such responds to the needs of its client group. The most commonly articulated need is that of language training for employment - either to utilise pre-existing skills, or to gain access to further education/training.

> "It appears that the knowledge of English is one of the principal determinants of the speed with which immigrants find rewarding and remunerative jobs. The lack of English in contrast is probably one of the most important causes of unemployment." 4

The following table from another ABS publication **"Overseas Born Australians 1988 - A Statistical Profile"** shows the labour force status by birthplace as of August 1987. Since September 1987 there has been an embargo on the release of these types of figures collected by CES offices, consequently it is very difficult to determine the success of the strategies adopted at a Commonwealth level to alleviate the disadvantage faced by people from NESBs in relation to employment.

TABLE 4.1. LABOUR FORCE STATUS BY BIRTHPLACE, AUGUST 1987

Birthplace	*Employed*	*Unemployed*	*Labour force*	*Unemployment rate*	*Labour force participation rate*
		'000		*per cent*	
		MALES			
Australia	3,162.6	247.8	3,410.4	7.3	76.4
Overseas	1,099.8	99.1	1,198.9	8.3	74.3
English speaking countries	499.2	35.0	534.2	6.6	77.1
Non-English speaking countries	600.6	64.1	664.7	9.6	72.1
Total	*4,262.3*	*347.0*	*4,609.3*	*7.5*	*75.8*
		MARRIED FEMALES			
Australia	1,245.6	62.9	1,308.5	4.8	49.0
Overseas	471.7	40.1	511.8	7.8	48.3
English speaking countries	212.7	13.4	226.1	5.9	52.7
Non-English speaking countries	258.9	26.7	285.6	9.3	45.2
Total	*1,717.3*	*103.0*	*1,820.3*	*5.7*	*48.8*
		ALL FEMALES			
Australia	2,153.7	186.1	2,339.8	8.0	50.3
Overseas	657.2	68.8	726.0	9.5	47.2
English speaking countries	313.4	27.3	340.7	8.0	51.4
Non-English speaking countries	343.8	41.5	385.3	10.8	44.1
Total	*2,810.8*	*254.9*	*3,065.8*	*8.3*	*49.5*
		PERSONS			
Australia	5,316.2	433.9	5,750.2	7.5	63.1
Overseas	1,756.9	168.0	1,924.9	8.7	61.1
English speaking countries	812.6	62.3	874.9	7.1	64.6
Non-English speaking countries	944.4	105.6	1,050.0	10.1	58.5
Total	7,073.2	601.9	7,675.1	7.8	62.6

Source: Labour Force Survey, August 1987

However this table does show that in 1987 the unemployment rate of people of NESBs was substantially higher than the average which goes towards supporting the previous statement from the CAAIP Report.

Returning to the AMEP - this Program has over the years sought to address the employment needs of immigrants of NESBs via its language training program and more recently in conjunction with DEET. NSW and Victoria largely in fact due to the substantial numbers of immigrants which both states attract, have developed the best co-operative training arrangements, however in this paper I will concentrate on arrangements in NSW.

PRE-EMPLOYMENT PROGRAMS

This section will be divided into two categories:

1. language training for employment in growth areas; and
2. language training for immigrants of NESBs with overseas qualifications.

1. The following table clearly shows employment growth by industry sector. In the service sector communication skills, both oral and written, are highly prized and it is here that English language skills are the most valued by employers. In NSW, programs conducted by the NSW Adult Migrant Education Service in conjunction with DEET are attempting to broaden the skills base of people of NESBs who are unemployed in order to gain access to employment in growth areas.

TABLE 1 - INDEXED EMPLOYMENT GROWTH BY INDUSTRY, AUSTRALIA
(Base: March 1984 = 100)

INDUSTRY	Year (March) 1985	1986	1987	1988
MINING	107.5	112.1	103.5	106.6
MANUFACTURING	99.2	103.5	102.6	104.4
Food/Beverages/Tobacco	98.2	104.6	106.9	106.7
Textiles	103.6	102.3	102.6	108.9
Knitting Mills/Cotton	102.2	109.7	106.5	103.1
Footwear	100.8	100.8	104.7	111.0
Wood & Wood Products	109.2	110.1	104.2	119.8
Furniture & Mattresses	103.0	110.1	121.0	134.8
Paper and Paper Products	88.0	94.8	97.2	96.8
Printing and Allied Ind	99.6	108.3	106.5	114.4
Chemical Products	97.8	101.8	97.5	95.1
Petroleum & Coal Products	91.2	96.5	96.5	75.4
Non Metallic Mineral	103.5	31.0	108.3	111.6
Basic Iron & Steel	93.4	95.0	94.0	95.2
Non Ferrous Metals	100.7	98.9	103.6	105.0
Fabricated Metal Products	96.8	104.3	102.6	107.5
Motor Vehicles & Parts	100.6	102.2	95.7	93.5
Other Transport Equip	107.5	109.5	98.0	95.1
Other Machinery/Equip	94.2	98.2	96.5	93.1
Miscellaneous	102.9	101.9	108.3	113.3
ELECTRICITY, GAS AND WATER	100.1	99.3	97.8	93.8
CONSTRUCTION	123.6	116.8	116.8	125.9
WHOLESALE AND RETAIL TRADE	105.1	112.4	115.7	122.2
Wholesale	106.0	113.1	117.9	125.2
Retail	104.6	112.1	114.6	115.3
- Motor Vehicles	106.1	111.9	109.3	117.2
- Other Retail	104.2	112.2	116.2	121.8
TRANSPORT AND STORAGE	102.5	104.9	105.3	106.9
COMMUNICATION	104.3	105.9	106.8	103.3
FINANCE, PROPERTY AND BUSINESS SERVICES	107.9	117.9	123.5	136.2
PUBLIC ADMINISTRATION AND DEFENCE	103.5	106.5	109.0	111.2
COMMUNITY SERVICES	104.7	109.6	113.2	116.8
Health	106.5	111.5	114.3	119.2
Education/ Museum/ Library	101.8	106.7	107.0	110.0
Welfare and Religious	108.4	112.0	130.5	133.9
Other Community Services	105.9	111.5	120.2	121.9
RECREATIONAL, PERSONAL AND OTHER SERVICES	107.7	117.5	118.8	130.4
TOTAL	104.7	109.7	111.6	116.5

Source: ABS Survey of Employment and Earnings (SEE), Australia

Examples: In the Finance, Property and Business Services which covers the office/clerical field programs have been designed to increase employment opportunities for both youth and adults of NESBs. In some cases programs have included vocational training with TAFE or other providers and have been immensely successful in terms of employment outcomes. The same can be said of language training programs for the hospitality industry. Another initiative developed in NSW concerns access to the Australian Traineeship System which provides board-based entry level training for youth entering non-trades occupations. The AMES in NSW is currently conducting its second Traineeship Access Course for youth of NESBs to enhance their language skills in order to compete successfully for Traineeships. This type of initiative has been strongly supported by DEET in NSW.

2. Language training for immigrants of NESBs with overseas qualifications.

This particular category of immigrant has been the subject of debate for a number of years with large numbers of papers written on the topic, numerous debates and governmental inquiries and it would appear in 1989 not much has been achieved to eliminate this wastage of skills. In a period of structural adjustment where labour shortages impede economic growth and activity the recognition of overseas qualifications is still subject o a maze of bureaucratic regulations.

"The procedures to gain qualification recognition, licensing or certification are often elaborate and complex requiring certified documentation, interviews, examinations and language tests. In many cases they delay the arrival of skilled immigrants in Australia. In many more cases immigrants fail to secure recognition. Immigration becomes a severe personal cost to the immigrant and Australia wastes valuable human resources." **5**

In NSW a program called CROSSOVER was developed for this group of immigrants of NESBs under the AMEP with very successful outcomes. With the gradual increase of skilled migration to NSW :

1986/87 Total skilled intake	- 17,390
NESB skilled intake	- 7,216
NSW NESB skilled intake	- 3,247

DEET has supplemented the delivery of such training programs and as of 1989 the NSW state government has provided substantial funding to minimise this wastage of skills. The program concentrates on developing the English language required for the performing of the specific occupation as well as acquainting course participants with the cultural features of job seeking in the Australian context. In addition voluntary work experience is gained in the participants occupation or a related field and this has proved a very useful aid in obtaining entry into the participant's profession. However the problem of recognition of overseas qualifications is still a vexed subject. In the debate on industry training, there is an indication that at the Commonwealth level changes will occur:

> "The need for the transferability of skills will require that mechanisms for setting standards and certifying the competence of individuals are accepted at least at an industry or occupational level. Credit will need to be given for skills acquired informally and those acquired overseas, as well as those acquired through structured domestic training. It is also important that competency certification provides for access to higher levels of education and training." **6**

TRAINING/RETRAINING FOR NEW TECHNOLOGIES AND INDUSTRIES SUBJECT TO INDUSTRY/AWARD RESTRUCTURING

The following table of employed persons by industry and by birthplace demonstrates that people of NESBs are still located in industries such as manufacturing that are subject o rationalisation in order to make them internationally competitive. I suspect as well that workers of NESBs are found in the unskilled/semiskilled areas of employment in this industry and with the introduction of new technologies will be the first to be retrenched or relocated in areas not subject to technological change.

TABLE 4.13. EMPLOYED PERSONS: INDUSTRY BY BIRTHPLACE, AUGUST 1987
(per cent)

	Industry								
Birthplace	*Agriculture, forestry, fishing hunting and mining*	*Manufacturing*	*Construction*	*Wholesale and retail trade*	*Transport, storage and communication*	*Finance, property and business services*	*Community services*	*Recreation, personal and other services*	*Total(a)*
				MALES					
Australia	10.8	17.3	9.3	19.1	9.8	9.7	10.7	4.9	100.0
Overseas	4.1	27.3	11.8	17.2	9.1	9.2	10.0	5.4	100.0
English speaking countries	4.5	22.1	10.8	18.0	9.2	11.5	12.6	5.0	100.0
Non-English speaking countries	3.8	31.6	12.7	16.5	8.9	7.2	7.8	5.7	100.0
Total	*9.1*	*19.9*	*10.0*	*18.6*	*9.6*	*9.6*	*10.6*	*5.0*	*100.0*
				MARRIED FEMALES					
Australia	6.9	9.1	3.1	20.4	3.7	11.7	31.3	9.6	100.0
Overseas	2.9	18.7	2.8	18.6	3.2	10.9	30.3	8.4	100.0
English speaking countries	3.3	10.9	3.2	19.6	2.4	11.5	36.4	8.3	100.0
Non-English speaking countries	2.7	25.1	2.4	17.8	3.9	10.0	25.2	8.6	100.0
Total	*5.8*	*11.7*	*3.0*	*19.9*	*3.5*	*11.4*	*31.0*	*9.3*	*100.0*
				ALL FEMALES					
Australia	4.7	8.9	2.1	22.7	3.6	13.0	29.6	10.3	100.0
Overseas	2.5	17.2	2.3	19.0	3.8	12.2	29.3	9.2	100.0
English speaking countries	2.8	10.3	2.6	20.3	3.0	12.8	34.7	9.2	100.0
Non-English speaking countries	2.4	23.4	2.1	17.8	4.5	11.6	24.4	9.1	100.0
Total	*4.2*	*10.8*	*2.1*	*21.9*	*3.6*	*12.8*	*29.5*	*10.0*	*100.0*
				PERSONS					
Australia	8.3	13.9	6.4	20.6	7.3	11.0	18.4	7.1	100.0
Overseas	3.5	23.5	8.3	17.9	7.1	10.3	17.2	6.8	100.0
English speaking countries	3.8	17.5	7.6	18.9	6.8	12.0	21.2	6.6	100.0
Non-English speaking countries	3.3	28.6	8.8	17.0	7.3	8.8	13.9	6.9	100.0
Total	7.1	16.3	6.9	19.9	7.2	10.8	18.1	7.0	100.0

(a) Includes the following industry groups not separately shown: electricity, gas and water, public administration and defence (civilians only).

Source: Labour Force Survey, August 1987

An example of such a manufacturing industry is BHP's Slab and Plate Division at Port Kembla NSW. With the recession of the early 1980's, this plant was unable to compete internationally with the result that thousands of unskilled/semi-skilled workers were retrenched. It was traditionally the largest employer of workers of NESBs in NSW and because of the devastating effect of these retrenchments on the economy of Wollongong, the Federal Government stepped in with the Steel Industry Plan. This plan allowed for a massive injection of capital that was invested in new technologies to modernise the production process with the result that it is now internationally competitive. Alongside of this capital investment a significant amount was invested in training/retraining the plant's existing workforce. Because of the Non-English Speaking component of the workforce, language training for this group is a priority.

54% of ironworkers and tradespeople employed at Slab and Plate are of NESBs and language programs have been designed to cater for the language needs of these workers by the NSW Adult Migrant Education Service. In-house and external training programs are being developed to provide new skills to effectively use the new technologies and in many cases workers of NESBs need bridging courses to allow them to access this training. Currently bridging

language courses for workers of NESBs are being conducted to allow access to in-house training for NSW Department of Industrial Relations and Employment tickets in crane driving, crane chasing, forklift driving etc.

With recapitalisation of the plant, computers are being used in much of the production process and the AMES has designed and is conducting a computer literacy course which allows workers of NESBs access to training programs for operators of computer terminals. In addition, literacy programs are underway which should ensure equal opportunity of access to training programs for workers of NESBs. This is of particular importance with the proposed restructure of the Metal and Engineering industry awarded which will dramatically effect work practices and require of the labour force a far broader skill base.

The ACTU's award restructuring document aims to establish "a simplified and modern award structure which enhances democratic work organisation, equal access and opportunity and eliminates all discriminatory provisions." 7

CONCLUSION

If the skill level of the Australian workforce is taken as the starting point for this paper, then the loss of resources that have been indicated earlier can no longer be tolerated. Australian industries are at a juncture where the quality of these human resources are the key element to the performance of our economy and issues such as the intersection of industry and award restructuring must have as a premise the principle of equality of opportunity as embodied in the ACTU document. To provide workers of NESBs the opportunity of progressing along a career path involves the development of a differential approach to vocational training. Such an approach would allow for programs that enable this group of workers to progress on their career path as far as they choose to with the support of bridging programs.

The same may be said of the need to establish mechanisms to allow access to pre-employment training/education programs for people of NESBs and other groups who are disadvantaged in terms of access to employment, education and training.

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1. Indexed employment growth by industry, Australia in DEET - MEETING AUSTRLIA'S SKILLS NEEDS. p19. AGPS. Canberra.

4.13 Employed persons: Industry by birthplace in ABS OVERSEAS BORN AUSTRALIANS 1988, p109. ABS Catalogue No. 4112.0.

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INTRODUCTION TO MICROWAVE COOKERY FOR DISABLED/AGED PERSONS

A presentation by Brian Cooper, a lecturer in food at Kensington Park College of TAFE, who developed the tape set entitled "Microwave Cookery for Independent Living", will introduce the use of the tapes.

The set consists of 4 audio cassette tapes which contain technical information about microwaves and their operation, directions for use, information about work areas, food preparation and storage and many recipes to prepare.

Brian will outline the background of the project's development, noting its wide support by education and health workers and the generous assistance by Sharp Industries.

The project initially targetted the cookery needs of visually disabled persons and was trialled extensively with them; its potential for other print handicapped persons was realised and several persons with severe specific learning difficulties also took part in its development.

Since then a wide variety of disabled persons, including quadraplegic and stroke victims has received tuition and purchased the tapes.

Brian will present a typical lesson using the assistance of a disabled person, probably a stroke victim with severe hemiplegia.

He will go through the processes step by step showing how the user sets up the necessary equipment and materials and then by selective time management goes through the recipe. It will show that the user can establish control over the entire process and so prepare a wide diversity of foods with minimum assistance.

Brian will show that microwave cookery is the safest and most feasible medium for disabled/aged persons to use and that the use of the tape set after initial introduction, presents the best opportunity to achieve some domestic independence.

CONTENTS

TAPE 1

Side 1: - Introduction
- How to operate your microwave
- How to choose a microwave oven to suit your needs

Side 2: - Some general points to remember to help you enjoy cooking in your microwave
- cooking terminology.
- What do you keep in your cupboards
- A list of equipment and utensils to help you organise the work area.

TAPE 2

It is important to remember the basic principles as they differ from conventional cooking. A training or retraining program illustrated with easy to achieve recipes enables the student to proceed with confidence.

TAPE 2

Contents:-

Side 1: - Some helpful hints to organise the work area
- Lets enjoy food but try to keep healthy
- The principles of microwave cookery Sessions 1 and 2.

Side 2: - The principles of microwave cookery Sessions 3 and 4.
Illustrated with recipes:-

Side 1: - A cup of coffee
- Iced lemonade
- Vegetable platter

Side 2: - Sauces and custards
- Fruit trifles
- A leg of lamb
- A chocolate cake.

TAPE 3

The Independent Lifestyle

All recipes are for 1 person and combine minimum skills and pre-prepared items to use when making meals from breakfast to main meals. A broad range of recipes basically using one dish.

The recipes are:-

Side 1: 1-4 beverages
5 porridge
6 stewed fruit
7 scrambled eggs
8 bacon
9 egg and bacon snack
10 anytime egg snack
11 pumpkin soup
12 vegetable peasant soup
13 tomato soup

Side 2: 14 Beans and burger snack
15 Chicken with tomato and cheese
16 Oriental chicken
17 Spinach and leek pie
18 Curried mushroom pie
19 Lamb with mushrooms
20 Chocolate cream
21 A baked apple
22 Spiced whipped cream
23 Date and nut cake

TAPE 4

Cooking for two or eat one freeze one.
The methods of storage and freezing plus reheating and defrosting are explained.
The recipes are chosen to be more creative and suitable for entertaining.
The recipes are:-

Side 1: - Vegetables
1 Frozen beans and corn
2 Broccoli with lemon butter
3 Spiced cabbage
4 Potatoes in jackets
5 Sweet potato and pumpkin bake
6 Vegetable casserole
7 Mushroom soup
8 Golden chicken and peaches

Side 2: 9 Pork and pineapple
10 Long grain rice
11 Tuna cream
12 Veal in cream sauce
13 A quick beef casserole
14 Hot spiced fruit salad
15 Pears in orange and passionfruit sauce
16 Brandy glazed bananas

EQUAL OPPORTUNITIES PANELIST TRAINING

Workshop Aims:

Participants will

* gain an overview of the training package
* examine the content of the package and specific delivery strategies
* experience a number of key exercises included in the package
* have the opportunity to discuss key questions related to Equal Opportunities in relation to DTAFE Selection procedures.

PRESENTERS: Susan Frazer
Gwyneth Ottrey
DTAFE (South Australia)

SELECTION PROCESSES & INTERVIEWING SKILLS

EQUAL OPPORTUNITIES (EO) PANELIST TRAINING

SUSAN A FRAZER
STAFF DEVELOPMENT CONSULTANT

Equal Opportunities Panelist Training is one of the strategies adopted as part of the Equal Opportunities Management Plan (EEOMP). The prime purpose of EEOMP is to ensure the most effective use of DTAFE human resources. The first EO Panelist Workshop was conducted in 1986 and an Equal Opportunities register has 200 trained panelists.

A review of use of EO panelist was conducted in 1987 which made recommendations related to the use of the register of EO Panelists, grievance process and procedural arrangements.

Training for EO Panelists involves a combination of the following: prereading materials (the EO Panelist Handbook together with 6 applications for mock shortlisting) and a one day program which includes presentations on the definition of merit and its relevance to the selection process, Equal Opportunity legal obligations, shortlisting criteria and a simulated shortlisting exercise based on the pre-reading, asking EO questions and the role of EO Panelists.

This workshop will give participants an opportunity to examine the processes and materials used in EO Panelist Training for DTAFE Selection panels.

8 February 1989

SF:MH
SUBMISSI/1SF3

THE NON ENGLISH SPEAKING BACKGROUND LEARNER IN TAFE

(A Trainer Training package for use in Vocational Training)

Workshop Aims:

Participants will

* gain an overview of the training package
* examine the content of the package and appropriate delivery strategies
* experience a number of key exercises included in the package
* have the opportunity to discuss key questions related to multicultural issues in Vocational Education

PRESENTERS: Stewart Mitchell
Susan Frazer
Gwyneth Ottrey

THE NON-ENGLISH-SPEAKING-BACKGROUND LEARNER IN TAFE

INTRODUCTION

1. Background to the Project

In September 1986 the Department of TAFE applied for a grant from the Tertiary Multicultural Education Committee. This grant was to employ a Project Officer for 3 months to design a staff development module which would address "factors relevant to providing education to students of diverse cultural background".

The rationale behind this project was based on the philosophy that people from non-English speaking backgrounds have a right to equality of access to and participation in mainstream TAFE programs. Whilst TAFE has successfully run courses geared to the needs of second language learners for some time, these courses have been mainly bridging into mainstream courses - therefore keeping non-English-speaking-background students on the fringe until they have been able to cope with mainstream study. To ensure equity for all Australians, provision for the needs of non-English-speaking-background students has to go beyond bridging courses and special 'migrant' programs.

In the light of South Australia's Equal Opportunity legislation which makes it mandatory that there is no discrimination on the grounds of race, sex, sexuality, marital status, pregnancy or physical impairment, the Department of TAFE, through its representative on T.M.E.C. felt that one of the first steps in adjusting mainstream courses was to raise the awareness of lecturers in TAFE to the factors relevant to the educational needs of non-English-speaking-background students.

A Project Officer was appointed in March 1987 to undertake the design of a staff development module.

THE STAFF DEVELOPMENT PACKAGE

1. A Handbook Format

The "The N.E.S.B. Learner in TAFE" staff development package is presented in the form of a handbook for trainers. This format fills a current gap in published materials particularly in the area of training materials for educators in an adult learning situation. Although the handbook is not primarily intended for use by individual lecturers, the inclusion of background reading material and references could provide a useful starting point to those lecturers who are interested in following up key issues in this field.

The handbook consists of eleven modules which are sequentially arranged. However, each is presented as a stand-alone unit, such that it can be used separately (as part of another training program) or in conjunction with selected other modules arranged according to the needs of the trainees.

2. The Modules - An Overview

The content for the modules has been selected in accordance with the aims of the overall program, and the considerations previously discussed.

Modules I, II and III examine the background of N.E.S. migrants in Australia. This includes the history of immigration to Australia, the experience of re-settlement, and the Australian Government's policies towards NES migrants over the years.

Modules IV and V examine classroom teaching practices and the ways in which they can be modified to meet the various needs of NESB students. A major component of these modules is the development of cross-cultural communication skills.

Module VI looks at the role of policy in TAFE in helping lecturers gain support for their work with NESB students and at the strategies which can be implemented at all levels of College operations to enable NESB students and potential students to gain equity of access and participation.

Modules VII and VIII focus on skills practice. This includes developing strategies for improving reading comprehension, understanding the principles of writing plain English, practicing writing 'technical' language in plain English, and practising speaking plain English in the simulated teaching situation.

Module IX extends this analysis of language use to examine language and cultural bias in assessment and materials, and to explore possible alternatives to current practices in assessment.

Module X provides trainees with information about special 'migrant' services and support services within TAFE and educational provision for NESB students outside TAFE.

Module XI requires participants to outline action which they will follow up in their work situations as an outcome of this staff development training. The module also includes an evaluation of the training sessions.

3. The Module Format

Each module consists of:

a. Aims and Objectives
b. Background Reading
c. Suggested Activities
d. Options for Training
e. Resources and Materials
f. References

3.1 Aims and Objectives

These state the main outcomes for each module, both in a general way and in specific behavioural terms.

3.2 Background Reading

These articles contain the main content for the module or provide background information on the issues raised in module. They are intended for the trainer as an easy reference guide or as professional update. Where appropriate, articles can be distributed to participants before-hand as pre-reading.

3.3 Suggested Activities

This section of the module is highly structured, setting out the procedure for conducting the activities and the key issues to be raised or questions to be asked. It also contains "Remarks to Trainers" where there are additional points to be considered.

3.4 Options for Training

As an alternative to the activities suggested the trainer may wish to choose other activities which also meet the stated objectives. For this reason, some options for training are included, but these should be regarded as samples only of any number of possible options.

3.5 Resources and Materials

Each module contains masters of the handouts for the suggested activities (where this is appropriate) and overhead projector masters. Where a video is used, its availability and source is stated. Trainers will need to make their required number of multiple copies of the handouts.

3.6 References

References are provided for participants and trainers. In the main, the material is recent and local. References are available through State libraries or through the Clearing House on Migrant Issues (133 Church Street, Richmond, Victoria).

4. The Time Allocation

There is no time allocated to each module. However, there is an assumption that Modules I to V would constitute a full day session and Module VII to IX a second full day session. This assumption places strict time constraints on the delivery of the material and alternative programming may be necessary (see Uses of Handbook). However, two full day sessions are seen as a minimum training time if lecturers are to have skills practice as well as information exchange.

THE NEW ENTRY LECTURER METHODS OF INSTRUCTION COURSE (NELMIC)

A 13 day introductory course for new entry vocational lecturers.

Workshop aims:

- gain an overview of the structure and content of this highly acclaimed course
- experience some structure learning activities from the course
- have the opportunity to discuss issues related to initial teacher training for vocational lecturers in South Australia

PRESENTERS: Stewart Mitchell
Bill Trengove
Susan Frazer

New Entry Lecturer Methods Of Instruction Course (NELMIC)

BACKGROUND

The NELMIC Course was first conducted by the Training and Development Branch of the Department of Technical and Further Education in January, 1976. The current course has, therefore, been guided by a proven strategy of workshops and teaching practice and incorporates a structure and variety of innovative methods and materials designed to meet a considerable diversity in participant needs and abilities.

PARTICIPANTS

Participants include those persons who provide, or intend to provide, learning opportunities for adults in the community. Those people may include both experienced and inexperienced educators, generally without formal training in adult teaching methodology.

The Course is primarily for Department of Technical and Further Education lecturing staff; but it may also include people from other government departments, community groups, private industry or individuals.

GENERAL OVERVIEW

The Course is 13 days (full time) in length, and is offered up to four times per year. The programme is designed to develop the planning, presentation and evaluating skills relevant to newly appointed lecturer/trainers.

In considering the structure of the course, the following four main features are identified:

1. **Core Workshops:** These are, programmed largely in the first six days of the course, providing a framework for microteaching.

2. **Elective Workshops:** These sessions are interspersed with microteaching in the second half of the course. Participants choice of electives is tied to a personal development plan.

3. **Microteaching:** Each participant teaches a total of 5 microteaching sessions and participants in other sessions by providing feedback to colleagues on their teaching performances.

4. **Reviews:** A range of activities, including course orientation, summaries and course feedback.

The model below indicates the approximate proportion of time spent in each area.

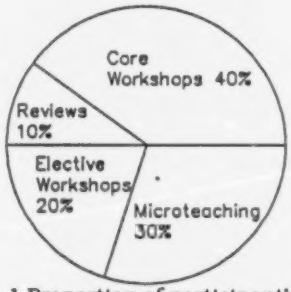

Fig. 1-1 Proportion of participant's time

Facilitating staff are drawn mainly from the Staff Development Branch and Colleges in the Department of Technical and Further Education.

The course is of a practical nature; participants develop their skills through a wide range of workshops and microteaching sessions.

COURSE PHILOSOPHY

In planning, administering, and conducting the course, considerable emphasis is placed on the following principles:

- Establishing and demonstrating models of performance
- Using a variety of teaching strategies and styles
- Utilizing a variety of human and material resources
- Providing optional and mandatory course components
- Integrating theory and practice
- Using methods which encourage learning through experience, reflection, theory and experiment
- Developing self-analysis and awareness to encourage participants to continue self-development both during and after the course
- Establishing and developing a safe, non-threatening environment (a collaborative rather than a competitive climate)

- Maintaining a conscious emphasis on learning and learner centredness
- Gradually increasing self confidence
- Developing a systematic approach to teaching
- Gradually devolving responsibility from the facilitator to the course participant
- Providing equality of learning experience, irrespective of race, gender, prior education, social background and religious convictions

COURSE AIM

The overall aim of the course is to provide a supportive and cooperative atmosphere in which participants can develop the skills of planning, preparing and presenting instructional sessions for adult learners.

By the end of the course participants will be able to plan and present learning experiences which demonstrate;

- Recognition of the difference between student and teacher centred activity and the importance of emphasising learning instead of "teaching".
- An appropriate choice of content to meet student needs and ability levels.
- A clear performance objective, including a statement of performance, condition, and standard.
- The application of the "principles of learning".

KEY ELEMENTS OF THE COURSE STRUCTURE

Student activity should represent a major part of each session

Wherever possible, use is made of participants collective experience within the group, with minimal emphasis on the 'expert' role of course facilitators

Both skills and theory teaching practice sessions are compulsory for participants

At least 30% of the course time should be programmed on microteaching, peer group feedback and self-analysis of teaching performance

Participants' confidence and learning is reinforced through positive feedback in teaching practice groups of no more than nine people. Negative feedback is minimal and based upon self or peer group analysis rather than expert comment

Participants are encouraged to utilize resources from outside of the Centre (e.g., TAFE Colleges and other educational institutions, libraries, etc.)

Facilitators are prepared to offer and conduct optional workshops which utilize their own particular skills and knowledge. There are not, however, expected to be expert in all aspects of adult learning and teaching.

Elective workshops are chosen be participants with the guidance of, and in consultation with, facilitators

A follow-up day to discuss changes in participant behaviour is programmed for approximately three months after the course.

TYPICAL PROGRAMME STRUCTURE

NELMIC is a dynamic programme and the topics outlines should be regarded as a guide only.

TOPICS COVERED IN THE CORE PROGRAMME

How Adults Learn/Principles of Learning
Planning a Training Session
Training Objectives
Task Analysis
Topic Analysis
Teaching a Skill Session
Teaching a Theory Session
Questioning Techniques
Giving and Receiving Feedback
Using the Overhead Projector
Using Boards and Flipcharts
Producing Audio Visual Materials
Equal Opportunity Issues in Education and Training
Working with Slow and Fast Learners
Student Assessment
Test Design
The Learning Environment

TOPICS COVERED IN THE ELECTIVE PROGRAMME

The elective programme varies according to the profile of the participants. Topics which have been offered include:

Group Dynamics
Developing Short Courses
Using Small Group Methods
Basic Counselling Skills
The Curriculum Process in TAFE
Working with Young Adults
Computer Assisted Learning
Evaluation Techniques
Conflict Management
Learning Style and Teaching Style
The Multicultural Learning Environment
Needs Analysis
Effective Speaking
Stress Management

STATEMENT OF COMPLETION

A statement of completion will be presented to those participants who successfully complete the course. The requirements for gaining a statement will be based upon:

1. The presentation of five microteaching sessions

2. Course attendance

3. The development of a personal learning contract

NELMIC is recognised by a number of awards within the South Australian College of Advanced Education (SACAE). For example, in the Diploma of Teaching (Further Education) NELMIC has been awarded three points. Participants should check the status of NELMIC when enrolling with SACAE.